GENERAL CATALOGUE

> **2013-2014**

riello ELETTRONICA

riello UPS AROS

Reliable power for a sustainable world

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Key

1:1	Single-phase input and output
1:3	Single-phase input, three-phase output
3:1	Three-phase input, single-phase output
3:3	Three-phase input and output
1-3:1	Single-phase or three-phase input, single-phase output
1-3:3	Single-phase or three-phase input, three-phase output
VI TYPE	UPS Line Interactive (Voltage Independent)
VFD TYPE	UPS VFD (Voltage Frequency Dependent)
VFI TYPE	UPS Online (Voltage Frequency Independent)

	UPS suitable for home - small office applications
	UPS suitable for data centre applications
	UPS suitable for electro-medical applications
	UPS suitable for industrial applications
	UPS suitable for transport applications (railways, airports, naval)
	UPS suitable for emergency applications

UPS with UL certificate

UPS with GS Nemko certificate

UPS ready for use in smart grids

Battery Swap. The batteries can be replaced during operation

UPS that can be combined with a flywheel

UPS also available with supercaps instead of batteries

Energy share. The load supplied from these sockets is not battery supported.

Plug and play. The UPS can be installed without the need for qualified personnel

Installation and initial start up should be carried out by qualified personnel

The device has a USB port

UPS classification Eco Level = 1

UPS classification Eco Level = 2

UPS classification Eco Level = 3

UPS classification Eco Level = 4

UPS classification Eco Level = 5

UPS classification Eco Level = 6

Riello Elettronica and Riello UPS

A global force

RIELLO ELETTRONICA, PART OF THE RIELLO INDUSTRIES GROUP, REPRESENTS AN ITALIAN MODEL FOR A GLOBAL COMPANY. THE RIELLO UPS BRAND IS NOW A WORLD LEADER IN THE UNINTERRUPTIBLE POWER SUPPLIES MARKET.

RIELLO ELETTRONICA

Riello Elettronica is the parent company of a group of industrial companies. Founded in 1986, Riello Elettronica initially manufactured switching power supplies for information technology applications, before moving into the manufacture of uninterruptible power supplies (UPS). In 1995 Riello Elettronica took on its present structure, organised as a holding company for the shares of the Group's businesses. In the meantime, the core business was extended to include energy, automation and safety.

ENERGY: PRODUCE IT, DISTRIBUTE IT, STORE IT

Thanks to Riello UPS, Riello Elettronica is today one of the four largest manufacturers of uninterruptible power supplies in the world, with a complete range of UPS able to satisfy any energy requirement, from individual personal computers to the large systems used in banks, hospitals and airports, where operational continuity is crucial. Of equal importance is Aros Solar Technology's contribution to the Group. This company designs, manufactures and sells solar inverters and solutions for photovoltaic energy.

Most of the manufacturing takes place in the plants in Legnago (Verona) and Cormano (Milano). The direct monitoring of international markets allows the Group to operate a single global strategy, expressed locally in the form of coherent sales policies that are easily adaptable to the realities of individual markets. In addition, Riello Elettronica's strong grounding in European and Asian marketplaces is fundamentally important to procurement, ensuring rapid, efficient and above all monitored selection and purchasing processes, especially with regards to the high quality electronic components used in the manufacturing process.

NOT JUST ENERGY

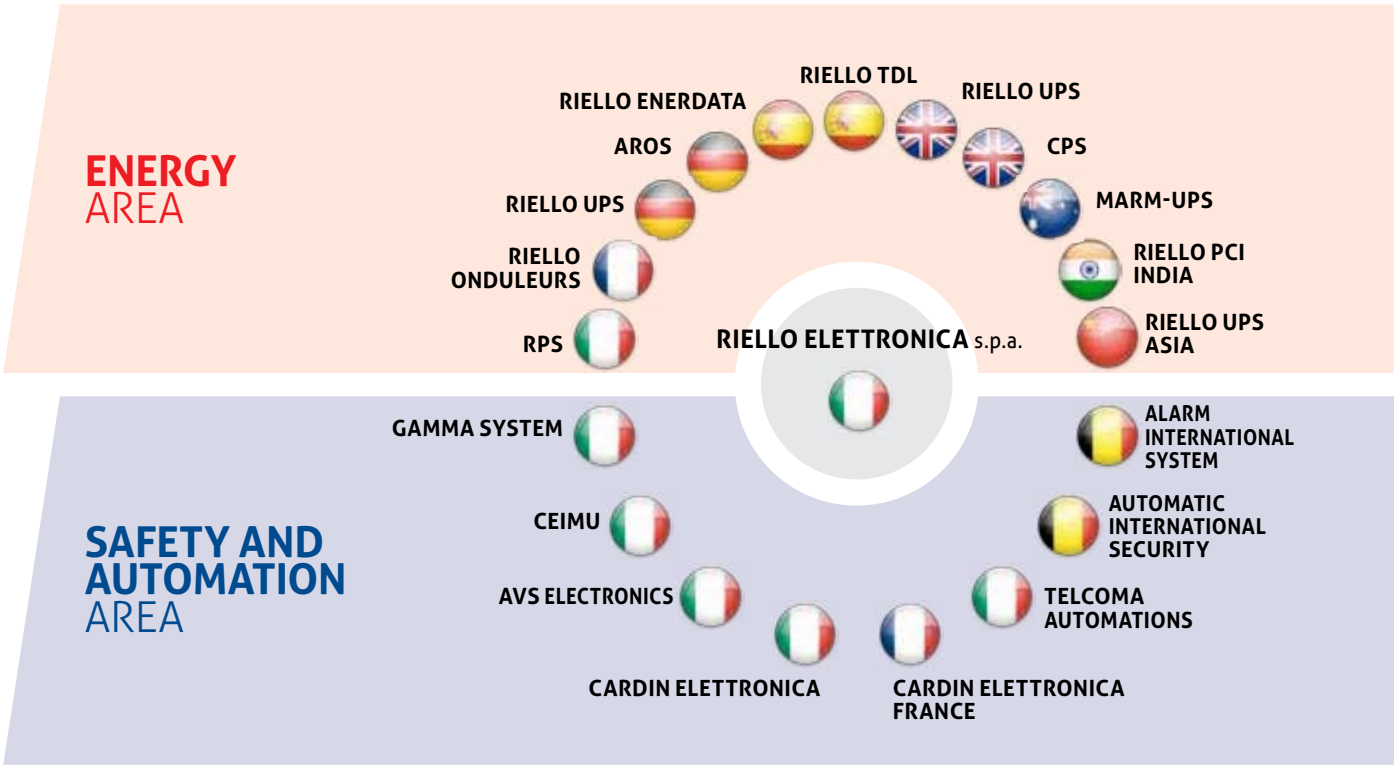
The Riello Elettronica group is also very active in the civil and industrial safety sectors, from domotics to oil hydraulic applications, through other industrial companies such as AVS Electronics, Cardin, Innovatech, Gamma System, Ceimu and Telcoma, which often collaborate together on large projects.
AVS Electronics, for example, is the national leader in the manufacture of alarm and anti-intrusion systems and it combines its

products with home automation systems made by Innovatech, offering a range of solutions able to communicate over a wireless network and interconnect the different domestic functions using intelligent terminals.
Domotics and photovoltaic technology in particular are driving the Riello Elettronica group into the future, creating new solutions for environmental well-being and everyday comfort supplied by energy from sustainable sources. The Group's companies are making the home intelligent; turning it into a place that can also be remotely controlled via Internet. Using a tablet, a notebook or a smart phone, the solutions offered by the Riello Elettronica Group allow you to monitor energy consumption, prevent black outs, keep out intruders, adjust the ambient temperature, switch on lights, open doors and gates, locate and stop water and gas leaks, etc.
Industrial safety and oil hydraulics are covered by Gamma System and Ceimu respectively. Gamma System manufactures electronic presence sensors and photoelectric barriers for monitoring access and for the safety of manufacturing machinery and systems in general. Ceimu manufactures servo controls, cylinders and oil hydraulic systems for general mechanical applications.

RIELLO INDUSTRIES

The Riello Industries group is the operating structure of the Riello family of companies.

Active since 1922, it includes the holding company Riello Elettronica and various other businesses in the Riello galaxy.
The Riello family of companies distinguishes itself in Italy for its innovative entrepreneurial structure. Despite being structured according to Anglo-Saxon governance models, which allow for the effective and rapid coordination of a large number of companies operating in bordering technological and commercial areas, it also manages to exceed the boundaries of a classic holding company by remaining closely connected to the territory and to the individual companies.
The Family Company Agreement is an important part of this; a single central force that defines and structures decisions related to both stock options and operational management.
Riello Industries is governed by Pilade Riello. His sons Pierantonio, Andrea, Giuseppe and Nicola, each control their own core businesses and the remaining shares are divided equally between the other brothers. Each following their own independent orbit, the companies belonging to the group rotate around this centre. They are held together by the Family Company Agreement, but they still retain their own autonomy and specific sector.



Our roots and our history

RIELLO ELETTRONICA HAS BEEN A SOLID POINT OF REFERENCE ON THE INDUSTRIAL WORLD STAGE FOR 25 YEARS, GAINING CREDIBILITY AS WELL AS DIFFERENTIATING ITS PRESENCE IN DIVERSIFIED MARKETS.

Guided successfully by Pierantonio Riello since the company was first set up, Riello Elettronica is about to celebrate its 25th anniversary as the market leader in Italy and one of the top players internationally in the energy conversion sector and in the manufacture of uninterruptible power supplies (UPS), intelligent electronic devices that operate as electrical power reserves in the event of mains power black outs.

Energy conversion is the group's core business area, this also includes new technologies for harvesting clean and renewable energy sources via the manufacture of solar inverters, a sector in which Riello Elettronica has become a national player.

Energy, but not only: the group has also been successfully investing in automation and civil and industrial safety for several years.

The group owns five manufacturing sites in Italy, twenty subsidiaries in Europe, China, India and Australia, and is present in over 80 countries worldwide. This is the Riello Elettronica Group today, the expression of an entrepreneurial tradition focused on innovation, global challenges and the development of 'made in Italy' technologies in the international marketplace.

riello AROS ups

DUCATI

Perfect synergy

High performance
Unlimited energy
Italian technology

This is what we have in common with Ducati

Riello UPS is the official sponsor of the Ducati Corse MotoGP Team. Our partnership with Ducati provides Riello UPS with high levels of visibility and worldwide prestige. The two companies share values and principles that unite them in perfect synergy.

DUCATI CORSE Official Sponsor

Riello UPS

Brand values

"RELIABLE POWER FOR A SUSTAINABLE WORLD" - THE RIELLO UPS PHILOSOPHY CONDENSED INTO A FEW SIMPLE WORDS - A GLOBAL BRAND CONSTANTLY SEARCHING FOR THE MOST INNOVATIVE SOLUTIONS

INNOVATION - THE SECRET OF AN ALL-ITALIAN SUCCESS STORY

Riello UPS offers a vast range of products, organised into 20 ranges of uninterruptible power supplies (UPS)-based on several different state-of-the-art technological architectures. Thanks to its two research centres in Legnago (Verona) and Cormano (Milan), world class centres of excellence for the design, development and testing of uninterruptible power supplies, Riello UPS can constantly innovate is product portfolio, keeping it at the top in terms of performance, reliability and competitivity. In addition, in the event of large tenders or commissions Riello UPS often also provides bespoke solutions based on the specifications provided, demonstrating its attention to the customer's individual .

Riello UPS designs and manufactures its UPS in Italy in order to maintain direct control over quality and reliability standards by closely following the entire manufacturing process, sales and after-sales service. This strategy allows for a process of continuous improvement, monitoring customers' opinions and using them to make rapid adjustments to optimise features as required by the market.

This process of continuous improvement, as well as having a direct effect and benefit on sales and after-sales service, helps to further consolidate Riello UPS's image as a reliable, dynamic and quality-oriented company.

It doesn't stop here however: the solid results achieved by Riello UPS in the development of UPS solutions equipped with completely innovative and avant-guarde technologies such as the PowerBox, SuperCaps UPS, and Smart Grid Ready UPS, i.e. ready for intelligent power distribution grids which represent the future of energy supply, are the best demonstration that innovation and quality really are the secrets of Riello UPS's success.

RELIABLE POWER FOR A SUSTAINABLE WORLD

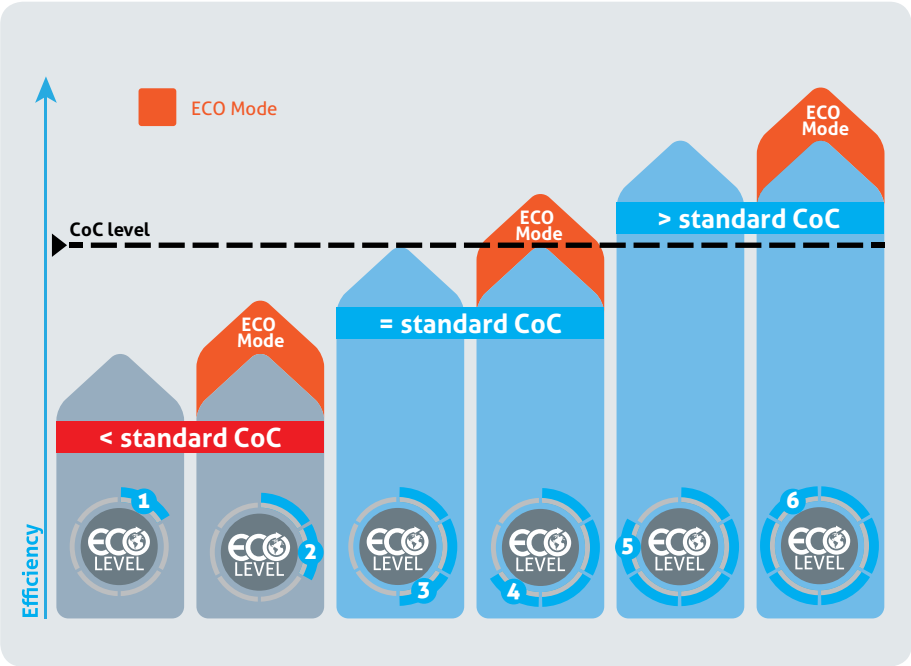
Riello UPS manufactures effective and efficient solutions that ensure power quality and business continuity, guaranteeing power supply and the correct operation of systems even in the event of critical situations.
Riello UPS is constantly implementing new solutions into its products that are aimed at reducing power consumption by increasing efficiency and actively participating in the promotion of sustainable development. To this end the company also sets up ecological projects and makes large investments in the development of new technologies for harvesting clean and renewable energy sources.
Riello UPS's social commitment aims to help the present as well as positively affecting the future, combining the inevitable need for energy with environmental protection. The environmental management system employed by Riello UPS is ISO14001 certified.
Riello UPS has always been a strong supporter of the Code of Conduct on Energy Efficiency and Quality of AC Uninterruptible Power Systems, a document signed by the major European manufacturers of UPS addressed to the European Commission. It sets out the energy efficiency targets for power ranges from 300 VA to >200 kVA, from 25% to 100% loads.
Riello UPS is also the first European manufacturer to identify its products in terms of energy efficiency.

ECO ENERGY LEVELS

Riello UPS uninterruptible power supplies power some of the most critical data centres and servers in use today. Within these environments, energy management is critical.

Running costs must be minimised without compromising resilience, i.e. the ability to adapt to adverse external conditions whilst ensuring complete availability of the services provided. Equipment must operate at the highest possible levels of efficiency to reduce the strain on critical power supplies and minimise the effect on the installation area.

Riello UPS models have always been compliant with the highest levels of efficiency in terms of energy protection and are classified according to a scale with 6 levels, corresponding with the efficiency value of the UPS with respect to the European Code of Conduct; this is known as the Eco Energy Level.



The ECO Energy Level is a tool implemented by Riello UPS to help customers to identify the products with the highest levels of efficiency in terms of energy protection; the 6 levels have recently been updated to comply with the stringent new efficiency levels that the CoC requires for 2013-2014.

In addition to this, the availability of the Smart Mode provides a further method for improving efficiency, improving the Eco Energy Levels assessment.

Riello UPS 's Eco Energy Level is more than just a concept; it is a system that demonstrates how the UPS that get the highest marks (levels 4, 5 and 6) are more efficient, and therefore more beneficial economically and environmentally.

The Eco Energy Level system demonstrates both how the most efficient UPS provide energy savings that allow the cost of their purchase to be recovered quickly with respect to standard efficiency UPS, as well as how their use leads to significant reductions in carbon emissions into the atmosphere.

An Energy Saving Calculator is available at www.riello-ups.com to help calculate the energy and cost savings as well as the reduction in CO_2 emissions that can be achieved by using Riello UPS Eco Energy Level products.

THE HUMAN FACTOR, ADDED VALUE

The concepts of product quality and excellence are central to Riello UPS's corporate philosophy, but this is combined with a further concept: the value of people, whether they are customers, users or colleagues.

At every staff level in Riello UPS, the sense of belonging to the company and respect for others has created an excellent working environment, which has been instrumental in achieving the great results enjoyed by Riello UPS. The team work that leads everyone to give their best every day, coordinating with colleagues to achieve the set results is the result of the careful selection, management and training of staff, but also and above all thanks to a healthy attitude of sharing targets at all levels and an ethical belief in added value.

One of the secrets of Riello UPS's success as a company is the reciprocal respect for each person's contributions and the shared effort to ensure the best levels of service and highest levels of customer satisfaction.

Proof of this are the awards that Riello UPS has received and continues to receive, the latest from Frost & Sullivan, who nominated Riello UPS "Company of the Year 2012".

UPS SMART GRID READY

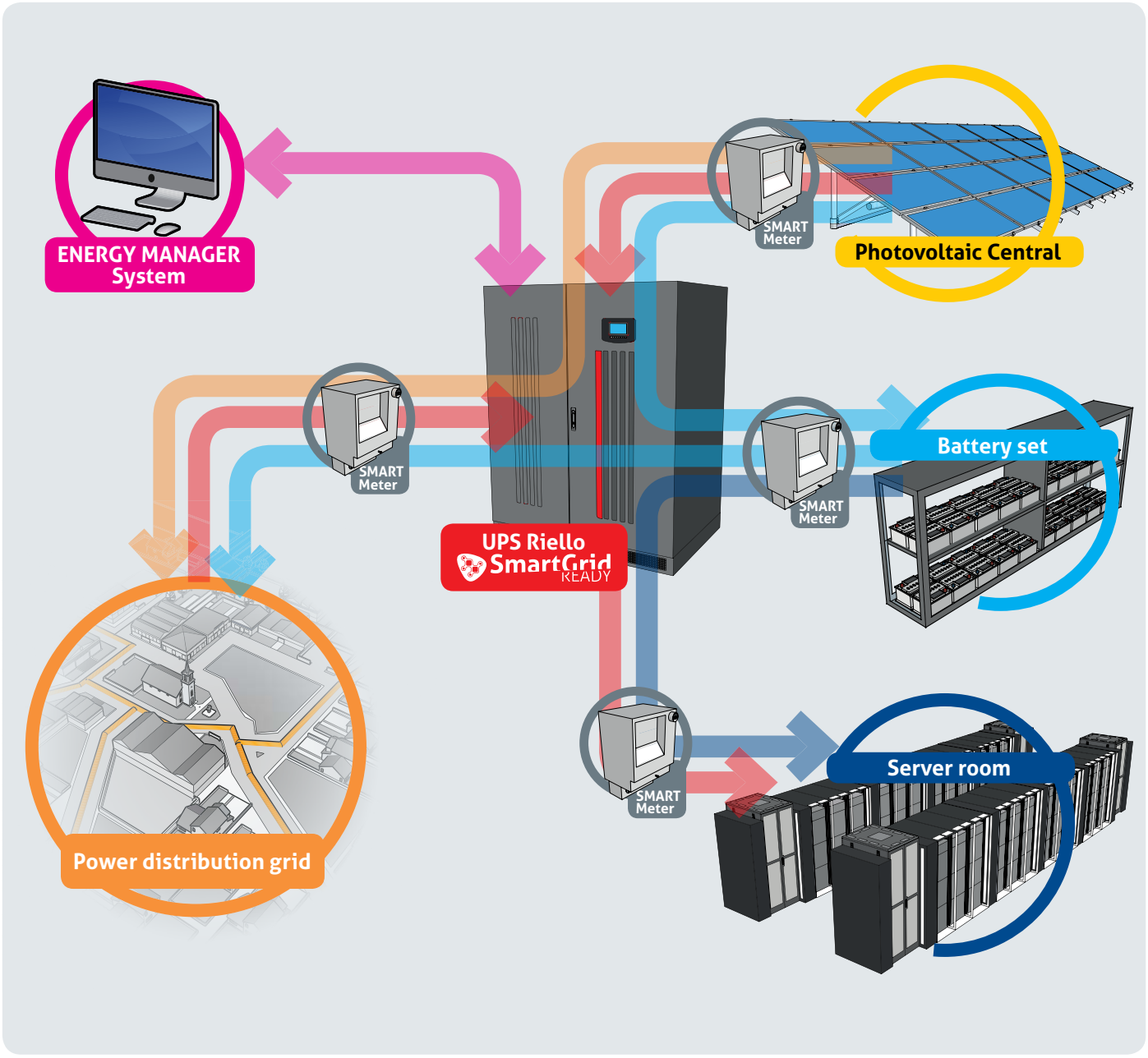
The evolution of electrical power grids is a key element for achieving greater sustainability; particularly fundamental are the power management systems for balancing supply and demand, for using energy in the most sustainable and efficient way: smart grids.

Smart grids are nothing more than power grids that efficiently integrate and manage the behaviour and actions of all the connected consumers (generators, output points, etc.), with the aim of ensuring the economically efficient operation of the electrical system, with a high level of safety, continuity and quality of supply.

Smart grids not only introduce new concepts to power grids but also new business opportunities with regards to installations with UPS: batteries of uninterruptible power supplies represent significant investments, but they are only partially used. Using these distributed power accumulators and generating business in power accumulation scenarios will become fundamentally important.

Smart grids also mean the integration of different energy sources, two-way flow, information exchange grids and centralised management. In this new scenario installations with UPS can take on new roles, becoming virtual power plants, decentralised power accumulation systems, variable power generators and above all they can be combined with renewable energy sources.

In order to be "smart grid ready", UPS must allow for the implementation of power accumulation solutions, and at the same time ensure extremely high levels of efficiency. They must also be able to independently select the most efficient operating method based on the status of the grid. They must be able to electronically interface with the energy manager using the smart grid communication network. Always open to technological innovation, Riello UPS has invested in research and technology to develop smart grid ready products, creating the Master HP, Master MPS and Multi Sentry ranges, the first smart grid ready UPS on the market.



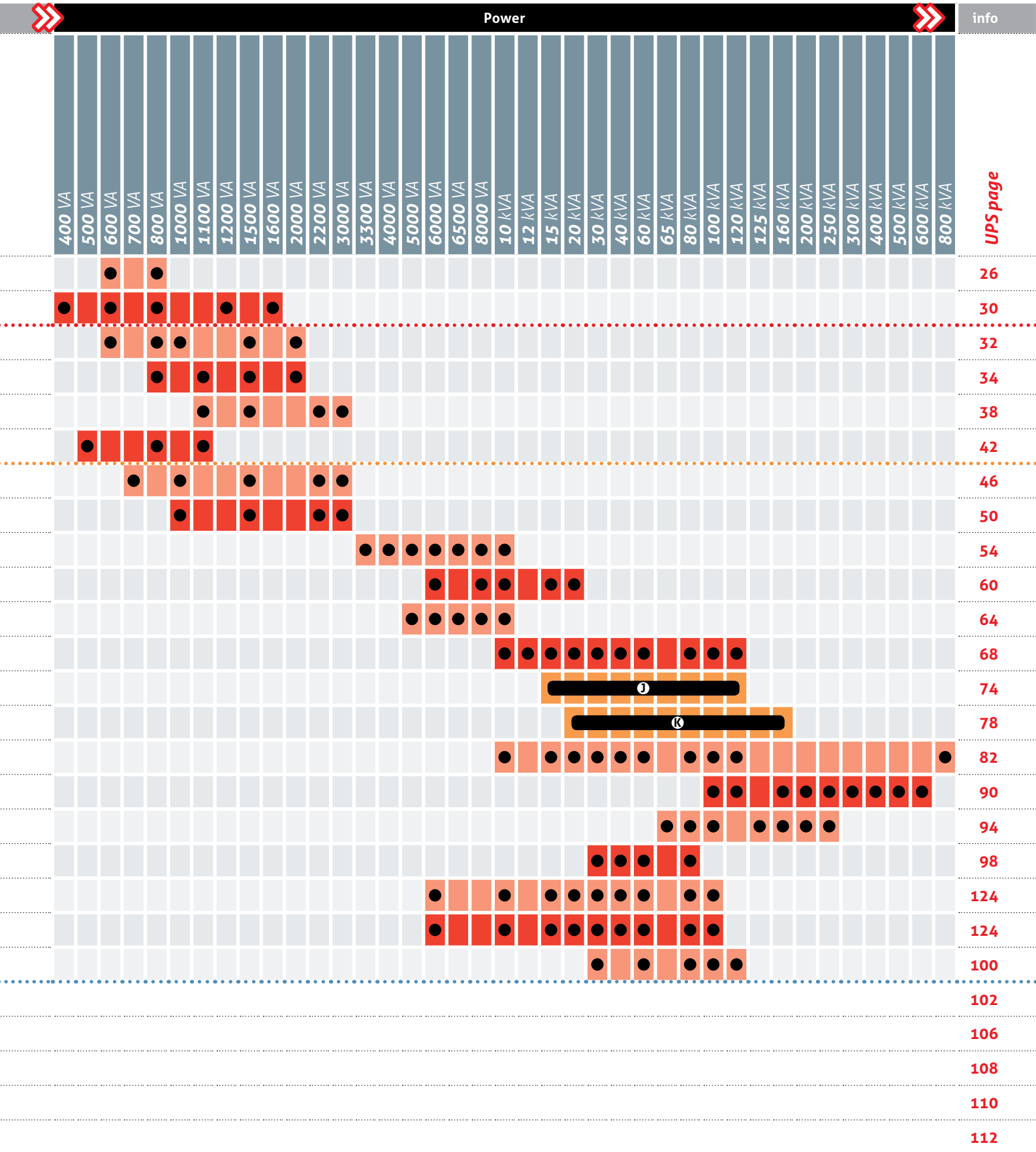
Guide to choosing a UPS

Choose the main parameters required for your installation and discover which UPS in the Riello range can meet your needs. Further details are provided in the dedicated pages for each product.

Parameters	Type			Instal	Specifications									Connect					Areas					
	UPS VFD	UPS Line interactive	UPS Online	Tower / Rack / Modular	1 - 1	1/3 - 1	1/3 - 3	3 - 3	Manual bypass	Internal batteries	Parallelable	Transformerless	Transforbased	USB	RS232	Dry contact	# Slot	EPO	Soho	DataCentre	e-Medical	Industry	Transport	Emergency
iPLUG	●			T	●					●		●		●		-			●					
iDIALOG	●			T	●					●		●		●		-			●					
NET POWER		●		T	●					●		●		●		-			●					
VISION		●		T	●					●		●		●	●	opt	1		●					
VISION DUAL		●		T/R	●					●		●		●	●	opt	1		●	●				
DIALOG VISION		●		R	●					●		●		●	●	opt	1		●	●				
SENTINEL PRO			●	T	●					●		●		●	●	opt	1		●		●	●		●
SENTINEL DUAL low power			●	T/R	●					●		●		●	●	opt	1		●	●	●	●	●	●
SENTINEL DUAL high power			●	T/R	Ⓐ	Ⓑ				●		●		●	●	opt	1		●	●	●	●	●	●
SENTINEL POWER GREEN			●	T	Ⓒ	Ⓓ			●	●	●	●		●	●	opt	1		●	●	●	●	●	●
SENTINEL POWER			●	T	Ⓔ	Ⓕ			●	●		●		●	●	opt	1		●	●	●	●	●	●
MULTI SENTRY			●	T		●		●	●	●	●	●		●	●	opt	2			●	●	●	●	●
MULTI GUARD			●	M				●	●	●	●	●				opt	1			●			●	
MULTI GUARD INDUSTRIAL			●	M		●	●		●		●	●		●	●	opt	2			●	●	●	●	
MASTER MPS			●	T		Ⓖ		●	●		●		●		●	std	2			●	●	●	●	●
MASTER HP			●	T				●	●		●		●		●	std	2			●	●	●	●	●
MASTER HP UL			●	T				●	●		●		●		●	std	2			●	●	●	●	●
MASTER INDUSTRIAL			●	T		Ⓖ			●		●		●		●	std	2					●	●	
EMERGENCY solution CSS 1 h			●	T		●		●	●		●	●		●	●	opt	2					●		●
EMERGENCY solution CSS 3 h			●	T		Ⓖ		●	●		●		●		●	std	2					●		●
MASTER FC400			●	T				●			Ⓗ		●		●	std	2						●	
MASTER STATIC BYPASS	-	-	-	T					-	-	-	-	-		●	std	2			●				
MULTI SWITCH	-	-	-	R	●				-	-	-	-	-		●	-				●				
MULTI SWITCH ATS	-	-	-	R	●				-	-	-	-	-	●	●	std	1			●				
MASTER SWITCH STS 1ph	-	-	-	R	●				-	-	-	-	-		●	std	1			●				
MASTER SWITCH STS 3ph	-	-	-	T				●	-	-	-	-	-		●	std				●				

Key

Ⓐ	3.3 - 4 - 5 - 6 - 8 - 10 kVA	Ⓔ	5 - 6 kVA	Ⓙ	1÷8 x 15 kVA
Ⓑ	6.5 - 8 - 10 kVA	Ⓕ	6.5 - 8 - 10 kVA	Ⓚ	1÷8 x 20 kVA
Ⓒ	6 kVA	Ⓖ	3ph input only	opt	optional
Ⓓ	8 - 10 - 15 - 20 kVA	Ⓗ	Except 30 kVA	std	standard



Options and accessories compatibility table

Identify the UPS that supports the software and accessories your installation requires.

Parameters	Software		Accessories										
	POWERSHIELD³ Shutdown software	***POWERNETGUARD*** Inventory manager software	***NETMAN 101 PLUS*** Box - Ethernet -SNMP	***NETMAN 102 PLUS*** Card - Ethernet -SNMP	***NETMAN 202 PLUS*** Card - Ethernet - SNMP v3	***MULTICOM 301*** Box - Modbus/Jbus interface	***MULTICOM 302*** Card - Modbus/Jbus interface	***MULTICOM 351*** Box - Interface duplexer	***MULTICOM 352*** Card - Interface duplexer	***MULTICOM 372*** Card - RS232 interface	***MULTICOM 382*** Card - Relay I/O interface	***MULTICOM 401*** Box - Profibus DP interface	***MULTI I/O*** Box - Relay I/O Card & Modbus/Jbus interface
iPLUG	●												
iDIALOG	●												
NET POWER	●												
VISION	●	●	●	●	●	●	●	●	●	●	●	●	●
VISION DUAL	●	●	●	●	●	●	●	●	●	●	●	●	●
DIALOG VISION	●	●	●	●	●	●	●	●	●	●	●	●	●
SENTINEL PRO	●	●	●	●	●	●	●	●	●	●	●	●	●
SENTINEL DUAL low power	●	●	●	●	●	●	●	●	●	●	●	●	●
SENTINEL DUAL high power	●	●	●	●	●	●	●	●	●	●	●	●	●
SENTINEL POWER GREEN	●	●	●	●	●	●	●	●	●	●	●	●	●
SENTINEL POWER	●	●	●	●	●	●	●	●	●	●	●	●	●
MULTI SENTRY	●	●	●	●	●	●	●	●	●	●	●	●	●
MULTI GUARD	●	●											
MULTI GUARD INDUSTRIAL	●	●	●	●	●	●	●	●	●		●	●	●
MASTER MPS	●	●	●	●	●	●	●	●	●			●	●
MASTER HP	●	●	●	●	●	●	●	●	●			●	●
MASTER HP UL	●	●	●	●	●	●	●	●	●			●	●
MASTER INDUSTRIAL	●	●	●	●	●	●	●	●	●			●	●
EMERGENCY solution CSS 1 h	●	●	●	●	●	●	●	●	●			●	●
EMERGENCY solution CSS 3 h	●	●	●	●	●	●	●	●	●			●	●
MASTER FC400	●	●	●	●	●	●	●	●	●			●	●
MASTER STATIC BYPASS	●	●	●	●	●	●	●	●	●			●	●
MULTI SWITCH		●		Ⓝ									
MULTI SWITCH ATS	●		●	●	●	●	●	●	●	●			
MASTER SWITCH STS 1ph	●		●	●	●	●	●	●	●				
MASTER SWITCH STS 3ph	●		●										

Key

Ⓛ	3300 - 4000 VA
Ⓜ	20 kVA 1:1, 40 kVA 3:3
Ⓝ	Included only in version N

Accessories												
INTERFACE KIT AS400	MULTIPANEL Remote Display interface	RTG 100 Modem GPRS	MODEM 56k	MODEM GSM	MANUAL BYPASS 16A MBB 16A	MANUAL BYPASS 16A RACK MBBR 16A	AUTOMATIC BYPASS 16A MBB 16A	AUTOMATIC BYPASS 16A RACK MBBR 16A	MANUAL BYPASS 100 A MBB 100A	Other specific options can be found on the dedicated product pages	ACRONYMS	info UPS page
										iPLUG	IPG	26
										iDIALOG	IDG	30
										NET POWER	NPW	32
●	●	●								VISION	VST	34
●	●	●			●	●	●	●		VISION DUAL	VSD	38
●	●	●								DIALOG VISION	DVR	42
●	●	●			●		●			SENTINEL PRO	SEP	46
●	●	●			●	●	●	●		SENTINEL DUAL low power	SDH	50
●	●	●			Ⓛ	Ⓛ	Ⓛ	Ⓛ		SENTINEL DUAL high power	SDL	54
	●	●							●	SENTINEL POWER GREEN	SPM / SPH	60
●	●	●							●	SENTINEL POWER	SPW / SPT	64
●	●	●	●	●					Ⓜ	MULTI SENTRY	MCM / MSM / MCT / MST	68
										MULTI GUARD	GMT	74
	●	●								MULTI GUARD INDUSTRIAL	GMI	78
●	●	●	●	●					Ⓜ	MASTER MPS	MPM / MPT	82
●	●	●	●	●						MASTER HP	MHT	90
●	●	●	●	●						MASTER HP UL	MHT UL	94
●	●	●	●	●						MASTER INDUSTRIAL	MIM	98
●	●	●	●	●						EMERGENCY solution CSS 1 h	C1T / C1M	124
●	●	●	●	●						EMERGENCY solution CSS 3 h	C3T / C3M	124
●	●	●	●	●						MASTER FC400	MFC	100
●	●	●	●	●						MASTER STATIC BYPASS	MSB	102
										MULTI SWITCH	MSW	106
										MULTI SWITCH ATS	MTA	108
										MASTER SWITCH STS 1ph	MMS	110
										MASTER SWITCH STS 3ph	MTS	112

SoHo Area

FEATURES

- Low energy consumption
- Small footprint
- Silent operation
- Advanced communication

APPLICATIONS

- **Entertainment systems**
- **Personal computers**
- **xDSL connections**
- **POS systems**

RECOMMENDED PRODUCTS

iPlug

Net Power

Vision

Vision Dual

Sentinel Pro

Sentinel Dual
Low Power

REFERENCES

Italy
- Consip
- Carrefour
- Dico / Coop

Sweden
- Ikea

Germany
- Hilton Hotel
- Mc Donald's

UAE
- Royal Intern.

Portugal
- Intermarché

France
- Carrefour

Australia
- Toys "R" us
- Lonely Planet

United Kingdom
- ASDA

The SoHo market is becoming more and more important, covering the market sector that includes professionals, small businesses and freelance professionals working from home. No less important are domestic consumers, with the rise of entertainment devices and media centres requiring ever higher quality power supply and protection from interference and black-outs.

LOW ENERGY CONSUMPTION

Reducing energy consumption has become an economical necessity as well as an environmental obligation. It is therefore essential to choose UPS that employ green technology such as those made by Riello UPS, designed to achieve the best energy efficiency and lowest environmental impact, whilst still providing the best possible performance.

SMALL FOOTPRINT

The small footprint of Riello's UPS allow them to be easily installed anywhere in the office work space, without creating any interference with customer areas. There are also rack versions.

SILENT OPERATION

In the workplace and above all in the home, the silent operation of equipment is very important. This is why our UPS are equipped with a sophisticated microprocessor control system able to reduce the speed of the fans and switch them off when not required.
The entire Off-line range offers maximum silent operation thanks to the employment of high frequency components and the absence of moving parts, the noise level is equal to 0 dbA.

ADVANCED COMMUNICATION

Riello UPS's UPS are equipped with USB and RS232 communication ports, allowing for full management and communication with the UPS to preserve data and make your IT systems secure.
UPS with LI and OL technology are also equipped with expansion slots to house the various different communication options offered by Riello UPS.

Datacenter Area

FEATURES

- Extremely high availability
- Low energy consumption
- Small footprint
- Flexible configurations

APPLICATIONS

- **Data centres**
- **Server farms**
- **Large databases**
- **Telecommunications and IT**
- **Banks and insurance companies**

RECOMMENDED PRODUCTS

Multi Sentry

Master MPS

Master HP

Multi Guard

Sentinel Power

Vision Dual

REFERENCES

China
- China Mobile

Korea
- Telecom

Germany
- Sun Microsystems
- German Government
- Deutsche Bank
- Allianz

India
- Samsung India Electronics
- Sify

Italy
- Poste Italiane
- Telecom Italia
- ENI
- Enel

Malaysia
- CSF

Spain
- Globalswitch
- Telefonica

United Kingdom
- ServerChoice
- UniLever

Data centres represent one of a company's most fundamental assets: a structure on which the entire organisation depends. This is why it is important to ensure these systems are both functional and reliable, starting from the correct electrical layout of the system and following precise quality criteria.

AVAILABILITY

According to the TIER standard, system availability should fall between 99.9 and 99.999%: downtime is not an option. Using high quality Riello UPS uninterruptible power supplies in a well-designed system, this level of availability can be achieved. The UPS must be versatile, compact and parallelable in order to provide the required flexibility; they should be able to adapt to all types of load, both inductive and capacitive, and should also be able to integrate with the other components in the system (e.g. electrical generators).

ENERGY CONSUMPTION

Reducing energy consumption has become a necessity for all businesses as well as an environmental concern. It is therefore fundamental to choose a UPS supplier that offers green products designed to provide the best energy efficiency and lowest environmental impact possible, with maximum performance. The **Eco Energy Levels** help identify the most highly efficient Riello UPS products.

PHYSICAL SPACE

It is critical to optimise the space available in data centres. Virtualising servers helps, but it is also useful to choose UPS with small footprints in order to avoid wasting space. The **Multi Sentry** and **Master HP** UPS ranges have some of the smallest footprints available on the market.

E-Medical Area

FEATURES

- Extreme protection for critical applications
- High resilience
- Compliant with specific standards

APPLICATIONS

- **Back up of auxiliary power supply systems**
- **Operating theatres**
- **Hospital services**

RECOMMENDED PRODUCTS

Sentinel Pro

Sentinel Power Green

Multi Sentry

Master MPS

REFERENCES

Austria
- Country Hospital Graz
- Krankenhaus (LKH) Salzburg

France
- Clinique De La Sauvegarde - Lyon
- Tropical Medicine Centre - Marseille
- Civil Hospital - Lyon

Germany
- Klinikum Süd Nürnberg
- Universität-klinikum Aachen

Italy
- Ospedale le Molinette - Turin
- Ospedale Cardarelli - Naples

Korea
- E-HWA University Hospital - Seoul

Spain
- Biomedical Research Park - Barcelona

Sri Lanka
- Apollo Hospital - Colombo

More and more sectors of the economy now rely on technology. Even medical and healthcare services now generally rely on digital technologies. Due to the critical nature of these applications, which are closely linked with personal well being, the services and infrastructure must be designed to ensure maximum levels of reliability and operating safety.

SAFETY

According to the standards that apply to the sector, all medical equipment must adhere to stringent safety standards. based on the type of application, the UPS must ensure immunity from external influences, providing compatibility with: IP protection levels, input/output electrical isolation, the possibility of housing internal isolation transformers and auxiliary monitoring systems for electrical values.
Riello UPS responds to all needs with products suited for all power and safety requirements connected with different applications.

RELIABILITY

In a medical context reliable services are critical and therefore the choice of UPS should favour the best technological solutions (on line dual conversion). These guarantee compatibility with all levels of architecture aimed at increasing the availability and resilience of the system (parallelability and redundancy of power supply in accordance with the TIER standard). Electrical continuity cannot be guaranteed unless it is supported by suitable monitoring and control systems, which should be flexible and adaptable to the various systems and protocols installed in healthcare infrastructures. Riello UPS develops, tests and perfects its products as well as the different monitoring and control systems in-house, guaranteeing complete flexibility with different protocols and a rapid response to any interface problems.

Industry Area

FEATURES

- Extremely high reliability and strength
- Customisable
- Compatible with long autonomy times
- ModBus and Profibus support

APPLICATIONS

- **Oil & Gas**
- **Power Generation, T&D**
- **Water treatment**
- **Instruments and process monitoring**
- **Emergency systems**

RECOMMENDED PRODUCTS

Sentinel Pro

Sentinel Power Green

Master MPS

Multi Guard Industrial

Master Industrial

SuperCaps UPS

REFERENCES

Germany
- Mannesmann
- Audi
- Adidas

India
- Metlon Industry

Italy
- Benetton Treviso
- Pirelli Milano
- Ilva
- La Doria
- Fincantieri

Spain
- Repsol

Sweden
- Ericsson
- Saab

Russia
- Ece

UK
- Glaxo Smith Kline
- Corus

Complex industrial installations are particularly critical and therefore require an exceptional level of resilience and reliability under all operating and environmental conditions.
The UPS is a fundamental asset for guaranteeing service continuity and system safety. Riello UPS's industrial solutions have been protecting oil and gas infrastructures, power stations and other industrial installations for decades, making Riello UPS the *industrial* partner for every business in the sector.

RELIABILITY

Operating continuity is fundamental in the industrial sector; a power shutdown or a breakdown in the supply of monitoring/control information cannot be tolerated. This is why high quality Riello UPS uninterruptible power supplies are used: versatile, technologically advanced and suitable for operation in varied environmental conditions (temperature, humidity, vibrations, fluctuating power supplies, etc.).

STRENGTH

In the industrial sector UPS are often required to provide a high level of compatibility with stringent mechanical standards (IP protection level > 21, protection against vibration, structural rigidity). In addition to this, in order to fulfil general requirements, the use of filters, isolated electrical connectors and special wiring (halogen free, etc) is often required, as well as fastening components and systems that are highly resistant to mechanical stresses.

FLEXIBILITY AND CUSTOMISATION

UPS Riello are flexible, i.e. they can be adapted to different power sources (single phase, three-phase, with or without neutral), they can be configured with isolation transformers not only at the output but also at the rectifier and bypass. They are compatible with various remote control communication protocols and can be customised to the specific requirements of any system.

Transport Area

FEATURES

- Protection for critical application
- Adaptability to different environments
- Flexibility of power supply
- Extremely resilient

APPLICATIONS

- **Railway stations**
- **Airports**
- **Toll gates**
- **Marinas**

RECOMMENDED PRODUCTS

Master HP

Multi Guard Industrial

Master MPS

Master FC400

REFERENCES

Germany
- Munich airport
- Hamburg railway station

Italy
- Underground railway Rome
- Underground railway Turin
- Malpensa Aiport

Spain
- Barajas Airport, Madrid
- High Speed Train A.V.E.

France
- CDG airport Paris
- Underground railway Paris

South Africa
- Johannesburg International Airport

United Arab Emirates
- Underground railway Dubai
- Etihad Airway
- Megacargo terminal Dubai

China
- Peking airport
- Underground Railway Nanjing
- Underground Railway Hong Kong

India
- Delhi underground railway

The infrastructure used in the transport sector is increasingly technologically advanced and complex. At the same time however, it must also provide an exceptional level of resilience and reliability under all operating and environmental conditions. UPS and power continuity play a major role in guaranteeing continuity and excellence in the services provided.

FLEXIBILITY OF INSTALLATION

Every application in the transport infrastructure sector has its own particular specifications and associated reference standards.
It IS therefore fundamental that the UPS are adaptable to different power sources (single phase, three-phase, with or without neutral), and compatible with various remote control communication protocols, which should be complete, rapid and effective.

GLOBAL STRENGTH

The need to ensure service continuity requires high levels of compatibility with stringent mechanical standards (IP protection, vibrations, structural rigidity). The use of air filters, isolated electrical connectors and special wiring is often required in order to fulfil general requirements, as well as fastening components and systems that are highly resistant to mechanical stresses. Riello UPS is able to offer tailor-made solutions that satisfy the requirements of special standards or particular operating conditions.

RELIABILITY

Operational continuity is strategic to the transport sector. Downtime with regards to power supply or monitoring/control information cannot be tolerated.
Continuity can be guaranteed by using high quality UPS that are versatile, technologically advanced and parallelable, which are able to operate under critical environmental conditions (temperature, fluctuating power supplies, different types of load, etc.). Riello UPS with its range of transformer-less and transformer-based products is able to satisfy the most diverse and complex requirements to ensure operating continuity and reliability for users.

Emergency Area

RECOMMENDED PRODUCTS

Sentinel Pro

Sentinel Dual
High Power

Sentinel Power

Master MPS

CSS 1h e 3h

FEATURES

- High reliability
- Compliant with standard EN 50171
- Batteries with 10 year life (at 20°C)
- Casing compliant with EN 60598-1
- Advanced diagnostics

APPLICATIONS

- **Hospitals**
- **Railway stations**
- **Stadiums and sports centres**
- **Shopping centres**
- **Schools**
- **Public buildings**

REFERENCES

Italy
- Juventus Stadium

Germany
- Allianz Arena

South Africa
- Ellispark Stadium
- Loftus Stadium

Spain
- Barcelona Olympic Stadium

Czech Republic
- Slavia Stadium Prague

Riello UPS centralised power supplies are designed for buildings subject to fire prevention safety standards.
Designed and built in compliance with standard EN 50171 CPSS (Central Power Supply Systems) and other guidelines. These systems are designed mainly to provide emergency lighting in the event of a power blackout, however, they can also be used for other emergency systems, such as for example:

- automatic fire prevention systems,
- alarm units and emergency detection systems,
- smoke extraction equipment,
- carbon monoxide detection systems,
- specific safety systems in sensitive areas.

The main features of Riello UPS solutions are summarised here:

- Regulatory compliance
- Autonomy of up to 3 h (and beyond on request)
- Battery recharge time under 12 hours
- Battery monitoring system
- Galvanic isolation of input/output (optional)
- Advanced diagnostics (information on display panel)
- Interface device to provide information remotely
- High short circuit current.

This is joined by Riello UPS's long term experience in emergency applications, with thousands of installations all over the world.

PRODUCT RANGE

SOHO

UPS **VFD**

iPlug

1:1 600-800 VA

USB
plug

GS Nemko
certified

Plug & Play
installation

HIGHLIGHTS

- **Compact**
- **Versatile**
- **Robust**
- **Contemporary design**
- **Auto restart**
- **Battery swap**

The iPlug series is the ideal solution for protecting household and small office systems. Its compact size and versatility (push-button operation, LED status panel and user replaceable batteries), make iPlug easy to install within a domestic environment to protect systems from surges and blackouts.
When the mains fails, the load is powered from a pseudo-sine wave inverter, to provide sufficient runtime for computer system shutdown using PowerShield[3] software, which can be downloaded free from **www.riello-ups.com**

Versatile, robust and contemporary design

The iPlug's compact and ergonomic design allow it to be easily installed in professional and domestic environments.
iPlug is extremely versatile and its innovative cable management feature ensures a tidy, easy to manage installation.

Advanced communications
PowerShield³ software allows for the safe shutdown of connected IT systems on mains power supply failure.
PowerShield³ provides efficient and intuitive UPS management using bar chart displays for important operating information.

Auto restart
The UPS automatically restarts upon the restoration of mains power after having shut down once the batteries have run out following a black out (Auto restart).

Environmental protection ECO Line
With energy savings in mind, the iPlug range features a shut-off button to reduce energy consumption during periods of prolonged inactivity.

Applications
LCD monitors, personal computers, video terminals, printers, scanners and fax machines.

Features
- Compact and ergonomic
- 5 sockets protected against black-outs
- 3 sockets protected against overvoltage for the supply of loads with larger absorption loads e.g laser printers
- Ability to switch on the UPS without a mains power supply (Cold Start)
- User replaceable batteries (Battery Swap)
- USB interface
- Floor-standing or desktop installation
- Power-supply cable included
- Built-in short circuit protection
- Auto restart (when mains power is restored, after discharge of the batteries)
- GS/Nemko safety seal
- Available with French (2P+T), British, Schuko and Italian outlets.
- PowerShield³ supervision and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X and Sun Solaris
- Plug and play function.

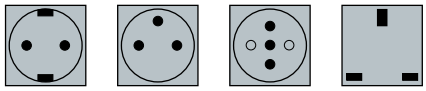
2-YEAR WARRANTY

CONFIGURATOR FOR MODEL SELECTION

Load type	VA power rating *
Personal computers	250
LCD Monitors	70
Scanners, printers	200
Modems, TVs, DVD players, PlayStations, Hi-Fi systems, telephones, Faxes	50
Laser printers **	200

* Estimated average value.
** iPlug filtered output power supply is recommended.

AVAILABLE SOCKETS

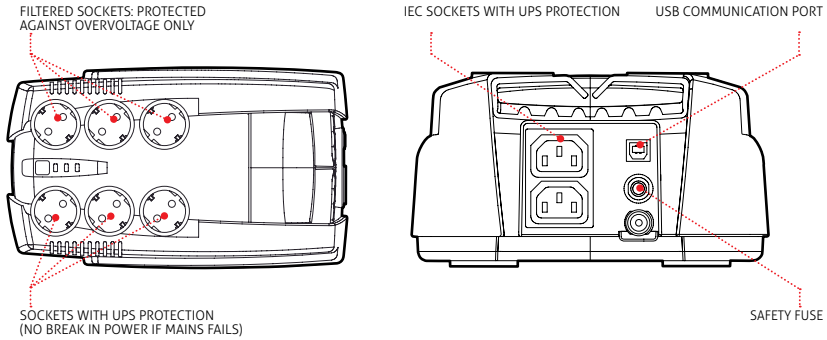


SCHUKO SOCKET CEE 7/7P | FRENCH SOCKET CEE 7/5 | ITALIAN SOCKET CEI 23/16 | BRITISH SOCKET BS1363A

AVAILABLE OPTIONS

SOFTWARE
PowerShield³

DETAILS


FILTERED SOCKETS: PROTECTED AGAINST OVERVOLTAGE ONLY
IEC SOCKETS WITH UPS PROTECTION
USB COMMUNICATION PORT
SOCKETS WITH UPS PROTECTION (NO BREAK IN POWER IF MAINS FAILS)
SAFETY FUSE

MODELS	IPG 600	IPG 800
POWER	**600 VA/360 W**	**800 VA/480 W**
INPUT		
Nominal voltage	220-240 Vac	
Input voltage tolerance frequency	230 Vac (+20/-25%)	
Frequency	50/60 Hz with automatic selection	
OUTPUT		
Voltage during mains operation	230 Vac (+20/-25%)	
Voltage during battery operation	230 Vac (+/- 10%)	
Frequency during battery operation	50 or 60 Hz (+/- 1%)	
Waveform	Pseudo Sinusoidal	
BATTERIES		
Type	VRLA AGM maintenance-free lead based	
Recharge time	6-8 hours	
OTHER FEATURES		
Net weight (kg)	3.7	4.1
Gross weight (kg)	4	4.4
Dimensions (WxDxH) (mm)	185 x 313 x 99	
Packaging dimensions (WxDxH) (mm)	260 x 380 x 140	
Protections	Excessive low battery - overvoltage - short circuit	
Communications	USB	
Output sockets	6 sockets (Schuko or Italian or French or British) + 2 IEC 320 C13	
Standards	EN 62040-1-1 and Directive 2006/95/EC; EN 62040-3 EN 62040-2 and Directive 2004/108 EC	
Certificates	CE; GS/NEMKO on Schuko version	
Operating temperature	0 °C / +40 °C	
Colour	Black	
Altitude and relative humidity	6000 m max altitude, < 95% non-condensing	
Equipment provided	power cable, user guide	

SOHO

UPS **VFD**

iDialog

1:1 400-1600 VA

USB plug

Plug & Play installation

HIGHLIGHTS

- **Compact**
- **Silent operation**
- **Contemporary design**
- **Auto restart**
- **Low power consumption**

The iDialog range is the ideal solution for protecting PCs and peripherals in the home and office.
iDialog is easy to install and economic to run for protecting:

- IT equipment such as PCs, Media Centres and peripherals, TVs, Home Cinema systems, Satellite and Digital Terrestrial Receivers and DVD recorders and players;
- xDSL modems and routers;
- Small home appliances.

Silent operation

The UPS is silent in operation (0dBA) thanks to its use of a fan-less design and high frequency components.

Advanced communications

PowerShield³ software allows for the safe shutdown of connected IT systems on mains power supply failure. PowerShield³ provides efficient and intuitive UPS management using bar chart displays for important operating information.

Auto restart

The UPS automatically restarts when the mains power supply is restored, after auto power.

ECO Line environmental protection

With energy savings in mind, the iDialog range features a shut-off button to reduce

MODELS	IDG 400	IDG 600	IDG 800	IDG 1200	IDG 1600
POWER	**400 VA/240 W**	**600 VA/360 W**	**800 VA/480 W**	**1200 VA/720 W**	**1600 VA/960 W**
INPUT					
Nominal voltage	220-240 Vac				
Input voltage tolerance frequency	230 Vac (+20/-25%)				
Frequency	50/60 Hz with automatic selection				
OUTPUT					
Voltage during mains operation	230 Vac (+20/-25%)				
Voltage during battery operation	230 Vac (+/- 10%)				
Frequency during battery operation	50 or 60 Hz (+/- 1%)				
Waveform	Pseudo Sinusoidal				
BATTERIES					
Type	VRLA AGM maintenance-free lead based				
Recharge time	6-8 h				
OTHER FEATURES					
Net weight (kg)	3.2		3.4	6.6	6.9
Gross weight (kg)	3.7		4.1	8.1	8.6
Dimensions (WxDxH) (mm)	90 x 232 x 192			93 x 310 x 270	
Packaging dimensions (WxDxH) (mm)	138 x 300 x 278			170 x 400 x 370	
Protections	Excessive low battery - overvoltage - short circuit				
Communications	USB			USB + RS232	
Output sockets	4 IEC 320 C13			6 IEC 320 C13	
Standards	EN 62040-1-1 and Directive 2006/95/EC; EN 62040-3 EN 62040-2 and Directive 2004/108 EC				
Certificates	CE				
Operating temperature	0 °C / +40 °C				
Colour	Black				
Altitude and relative humidity	6000 m max altitude, <95% non-condensing				
Standard equipment	2 output power supply cables, 1 USB cable, user manual				

energy consumption during periods of prolonged inactivity.

Features

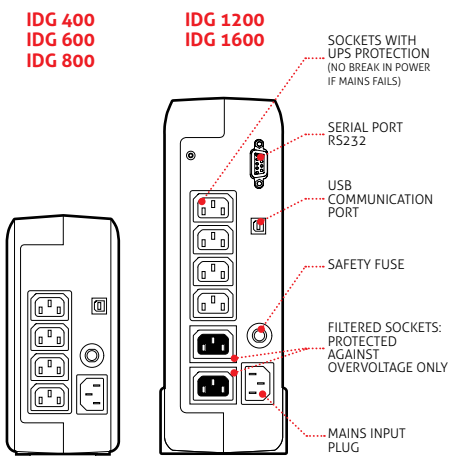
- Reduced energy consumption and 99% efficiency
- Maximum reliability and protection of PCs thanks to PowerShield³ monitoring and shutdown software, which can be downloaded free at **www.riello-ups.com**
- Can be installed on PCs with Windows 8, 7, 2008, Vista, 2003, Xp, Linux, Mac OSX and Sun Solaris operating systems
- Small size: With its compact shape, iDialog can be placed anywhere on the desk or in the home.
- Silent: iDialog is also suitable for protecting your non-professional digital equipment such as home cinema systems, satellite and digital terrestrial receivers and DVD players/recorders.

2-YEAR WARRANTY

AVAILABLE OPTIONS

SOFTWARE
PowerShield³

DETAILS



SOHO

VI TYPE
LINE INTERACTIVE

Net Power

1:1 600-2000 VA

5 ECO LEVEL

USB
USB plug

P&P
Plug & Play installation

HIGHLIGHTS

- **Automatic Voltage Regulation (AVR)**
- **Advanced communications**
- **Automatic battery test**

The Net Power series is available in 6002000 VA models with digital technology: when available the load is supplied from the mains power supply, which is amplitude-stabilised by the automatic voltage regulator (AVR) and filtered against overvoltages by EMI filters.
When the mains fails, the load is powered from a pseudo-sine wave inverter, to provide sufficient runtime for computer system shutdown using PowerShield³ software, which can be downloaded free from **www.riello-ups.com**

Features

- Stabilisation and filtering of the mains power supply using AVR and EMI filters for the suppression of atmospheric disturbances
- Ability to switch on the UPS in the absence of mains power (Cold Start)
- High reliability with built-in battery test
- Auto restart (when mains power is restored, after discharge of the batteries)
- Supplied with two IEC cables for powering the loads.

Advanced communications

- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ supervision and shutdown software for Windows operating systems 7, 2008, Vista, 2003, XP, Linux, Mac OS X and Sun Solaris
- Standard USB interface, RS232 on models 1000 - 1500 - 2000.

2-YEAR WARRANTY

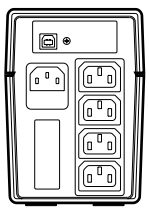
MODELS	NPW 600	NPW 800	NPW 1000	NPW 1500	NPW 2000
POWER	**600 VA/360 W**	**800 VA/480 W**	**1000 VA/600 W**	**1500 VA/900 W**	**2000 VA/1200 W**
INPUT					
Nominal voltage	220-230-240 Vac				
Input voltage tolerance	230 Vac (±25%)				
Frequency	50/60 Hz with automatic selection				
OUTPUT					
Voltage during mains operation	230 Vac (-8%, +10%)				
Voltage during battery operation	230 Vac (+/- 5%)				
Frequency during battery operation	50 or 60 Hz (+/- 0.5%)				
Battery waveform	Pseudo sinusoidal				
BATTERIES					
Type	VRLA AGM maintenance-free lead based				
Recharge time	6-8 h		2-4 h		
OTHER FEATURES					
Net weight (kg)	4.3	4.9	8	11.1	11.5
Gross weight (kg)	5.6	6.3	10	13.5	14
Dimensions (WxDxH) (mm)	100 x 287 x 142		146 x 350 x 160	146 x 397 x 205	
Packaged dimensions (WxDxH) (mm)	140 x 332 x 220		195 x 440 x 250	230 x 480 x 280	
Protections	Excessive low battery - overvoltage - short circuit				
Communications	USB		USB + RS232		
Output sockets	4 IEC 320 C13 sockets			6 IEC 320 C13 sockets	
Standards	EN 62040-1-1 and Directive 2006/95/EC; EN 62040-2 category C2 and Directive 2004/108 EC				
Certificates	CE				
Operating temperature	0 °C / +40 °C				
Colour	Black				
Altitude and relative humidity	6000 m max altitude, <95% non-condensing				
Standard equipment	2 cables for powering loads; user manual				

AVAILABLE OPTIONS

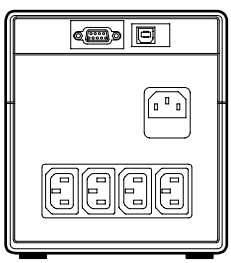
SOFTWARE
PowerShield³

DETAILS

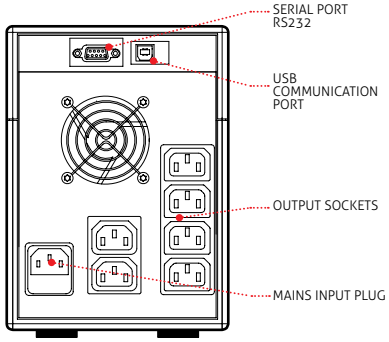
NPW 600
NPW 800



NPW 1000



NPW 1500
NPW 2000



SOHO

VI TYPE
LINE INTERACTIVE

Vision

1:1 800-2000 VA

USB plug

Hot swap battery

Plug & Play installation

HIGHLIGHTS

- **Superior protection**
- **Compact and contemporary design**
- **High availability**
- **Versatility**
- **LCD display**
- **Automatic Voltage Regulation (AVR)**

The Vision range is available in models from 800 VA to 2000 VA with sinusoidal digital technology.
The Vision range, with its advanced communications and connectivity options, is the ideal solution for installations requiring superior protection and versatility in the power supply system. Vision is the ideal solution for the protection of peripheral network devices, servers, and network back-up systems.

Superior protection

The Vision range uses Line Interactive technology and provides a sinusoidal output. This technology provides efficiency levels of 98% and therefore reduced energy consumption. It also ensures a high level of protection against mains power disturbances. The automatic voltage regulator (AVR) provides protection from surges, overvoltages and undervoltages, without battery intervention. Reduced battery usage ensures that the battery set is 100% available for mains power supply failures and is able to provide greater autonomy. EMI filters then provide further protection from voltage surges and transients.
When the mains power supply fails, the load is powered by the inverter and receives a perfectly sinusoidal supply for maximum power continuity and reliability. With energy savings in mind, the Vision range features a shut-off button to reduce energy consumption to zero during periods of prolonged inactivity.

High availability

An EnergyShare socket allows load-shedding and the shutdown of less sensitive

peripheral devices to extend battery runtime for critical loads. "Hot Swap" batteries can be removed via the front panel for easy and safe
UPS maintenance.
Battery test facility to detect deteriorating battery performance.
Deep discharge protection to reduce battery ageing.

Versatility

Cold Start function to allow the UPS to power up with no mains power supply present.

LCD display

Vision models have a backlit LCD display providing UPS status information, load and battery performance.

Advanced communications

- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, Linux, VMWare ESX and other Unix operating systems
- USB or RS232 serial port interface (selectable)
- Expansion slot for interface boards
- Status, measurements, alarms and input, output and battery parameters available on LCD display.

Features

- EnergyShare socket
- Ability to switch on the UPS in the absence of mains power (Cold Start)
- Batteries are user replaceable without switching off equipment and without interruption to the load (Hot Swap)
- Maximum reliability and protection of PCs thanks to PowerShield³ monitoring and shutdown software, which can be downloaded free at **www.riello-ups.com**
- Fully configurable using UPS Tools configuration software
- Highly reliable batteries (automatic and manually-activated battery test)
- Built-in short circuit protection
- Auto restart (when mains power is restored, after discharge of the batteries)
- GS/Nemko safety seal

2-YEAR WARRANTY

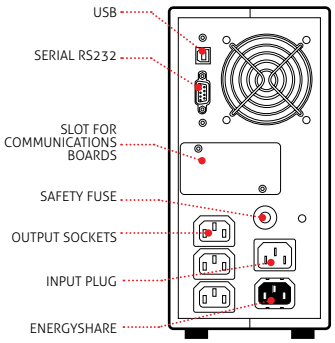
AVAILABLE OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

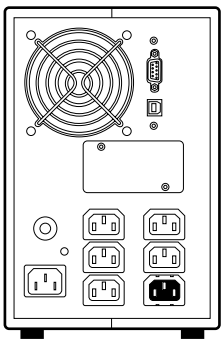
ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100

DETAILS

VST 800
VST 1100



VST 1500
VST 2000



MODELS	VST 800	VST 1100	VST 1500	VST 2000
POWER	**800 VA/640 W**	**1100 VA/880 W**	**1500 VA/1200 W**	**2000 VA/1600 W**
INPUT				
Nominal voltage	220 - 230 - 240 V selectable			
Voltage tolerance	162 V - 290 V			
Frequency	50/60 Hz with automatic selection			
Frequency tolerance	±5%			
OUTPUT				
Nominal voltage	220 - 230 - 240 V selectable			
Frequency	50 or 60 Hz with automatic selection			
Waveform	Sinusoidal			
BATTERIES				
Type	VRLA AGM maintenance-free lead based			
Recharge time	4-6 h			
OTHER FEATURES				
Net weight (kg)	10.5	11.3	16.5	18.5
Gross weight (kg)	12.2	13	18.4	20.4
Dimensions (WxDxH) (mm)	120 x 443 x 247		160 x 443 x 247	
Packaging dimensions (WxDxH) (mm)	208 x 530 x 342		235 x 540 x 354	
Protections	Overload - short-circuit - overvoltage - undervoltage - temperature - excessive low battery			
Communications	USB / RS232 / slot for communications interface			
Input plugs	1IEC 320 C14			
Output sockets	4 IEC 320 C13		6 IEC 320 C13	
Standards	EN 62040-1-1 and Directive 2006/95/EC EN 62040-2 and Directive 2004/108 EC			
Operating temperature	0 °C / +40 °C			
Storage temperature	-15 °C / 45 °C			
Colour	Black			
Relative humidity	<95% non-condensing			
Noise	< 40 dBA			

SALE
-50%

SOHO

DATACENTER

VI TYPE
LINE INTERACTIVE

Dialog Vision

1:1 500-1100 VA

ECO LEVEL 5

USB
USB plug

Hot swap battery

P&P
Plug & Play installation

HIGHLIGHTS

- **Superior protection**
- **High availability**
- **Versatility**
- **LCD display**
- **Automatic voltage regulation (AVR)**

The Dialog Vision range is available in models from 500 VA to 1100 VA with sinusoidal digital technology.
The Dialog Vision range, with its advanced communications and connectivity options, is the ideal solution for installations requiring superior protection and versatility in the power supply system. Dialog Vision is the ideal solution for the protection of peripheral network devices, servers, and network back-up systems.

Superior protection

The Dialog Vision range uses Line Interactive technology and provides a sinusoidal output voltage. This technology provides efficiency levels of 98% and therefore reduced energy consumption. It also ensures a high level of protection against mains power disturbances.
The automatic voltage regulator (AVR) provides protection from surges, overvoltages and undervoltages, without battery intervention.
Reduced battery usage ensures that the battery set is 100% available for mains power supply failures and is able to provide greater autonomy.
EMI filters then provide further protection from voltage surges and transients.

When the mains power supply fails, the load is powered by the inverter and receives a perfectly sinusoidal supply for maximum power continuity and reliability.

High availability

An EnergyShare socket allows load-shedding and the shutdown of less sensitive peripheral devices to extend battery runtime for critical loads.
"Hot Swap" batteries can be removed via the front panel for easy and safe UPS maintenance.
Battery test facility to detect deteriorating battery performance.
Deep discharge protection to reduce battery ageing.

Versatility

Cold Start function to allow the UPS to power up with no mains power supply present.

Display

Vision models have a backlit LCD display providing UPS status information, load and battery performance.

Advanced communications

- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, Linux, VMWare ESX and other Unix operating systems
- USB or RS232 serial port interface (selectable)
- Expansion slot for interface boards
- Status, measurements, alarms and input, output and battery parameters available on LCD display.

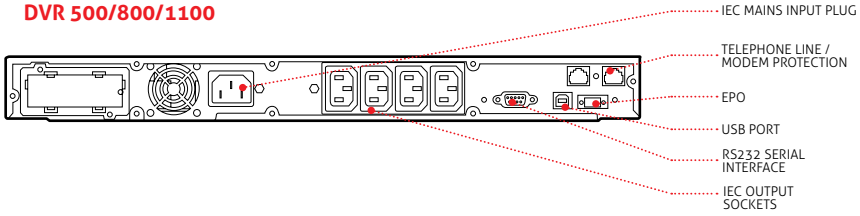
Features

- EnergyShare socket
- Ability to switch on the UPS in the absence of mains power (Cold Start)
- User-replaceable battery set (Battery Swap)
- USB and RS232 interface
- Slot for communications boards
- Maximum reliability and protection of PCs thanks to PowerShield³ monitoring and shutdown software, which can be downloaded free at **www.riello-ups.com**
- Highly reliable batteries (automatic and manually-activated battery test)
- Built-in short circuit protection
- Auto restart (when mains power is restored, after discharge of the batteries)
- Emergency power off contact (EPO).

2-YEAR WARRANTY

DETAILS

DVR 500/800/1100



OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100

PRODUCT ACCESSORIES
Universal rails for installation in rack cabinets

MODELS	DVR 500	DVR 800	DVR 1100
POWER	**500 VA/350 W**	**800 VA/540 W**	**1100 VA/740 W**
INPUT			
Nominal voltage	230 Vac (200, 208, 220, 240 V selectable)		
Voltage tolerance	160 V - 294 V		
Frequency	50/60 Hz with automatic selection		
Frequency tolerance	±5%		
OUTPUT			
Nominal voltage	230 Vac (200, 208, 220, 240 V selectable)		
Frequency	50 or 60 Hz with automatic selection		
Waveform	Sinusoidal		
BATTERIES			
Type	VRLA AGM maintenance-free lead based		
Recharge time	4-6 h		
OTHER FEATURES			
Net weight (kg)	12	13.5	15.6
Gross weight (kg)	16	18	20
Dimensions (WxDxH) (mm)	19" x 460 x 1U		
Packaged dimensions (WxDxH) (mm)	605 x 623 x 200		
Protections	Overload - short-circuit - overvoltage - undervoltage - temperature - excessive low battery		
Communications	USB / RS232 / slot for communications interface		
Input plugs	1 IEC 320 C14		
Output sockets	4 IEC 320 C13		
Standards	EN 62040-1-1 and Directive 2006/95/EC; EN 62040-2 and Directive 2004/108 EC		
Operating temperature	0 °C / +40 °C		
Storage temperature	-15 °C / 45 °C		
Colour	Black		
Relative humidity	<95% non-condensing		
Noise	< 50 dBA		

SOHO

DATACENTER

VI TYPE
LINE INTERACTIVE

Vision Dual

1:1 1100-3000 VA

6 ECO LEVEL

USB
USB plug

Hot swap battery

Energy share

P&P
Plug & Play installation

HIGHLIGHTS

- **Automatic Voltage Regulation (AVR)**
- **Superior protection**
- **High efficiency**
- **High availability**
- **Versatility**
- **Advanced communications**

The Vision Dual range (tower and rack), includes models from 1100 VA to 3000 VA with sinusoidal digital technology.
The Vision Dual range, with its advanced communications and connectivity options, is the ideal solution for installations requiring superior protection and versatility in the power supply system.
Vision Dual is the ideal solution for the protection of peripheral network devices, conventional or rack servers, and network back-up systems.
Vision Dual has a practical, modern design and includes several performance advantages over traditional on-line UPS. All developed by the Riello UPS research and development team.

The UPS provides efficiency levels of 98% and therefore reduced energy consumption. It has an output power factor of 0.9.

Superior protection

The automatic voltage regulator (AVR) provides protection from surges, overvoltages and undervoltages, without battery intervention. Reduced battery usage ensures that the battery set is 100% available for mains power supply failures and is able to provide greater autonomy. EMI filters then provide further protection from voltage surges and transients. When the mains power supply fails, the load is powered by the inverter and receives a perfectly sinusoidal supply for maximum power continuity and reliability.

High availability

An EnergyShare socket allows load-shedding and the shutdown of less sensitive peripheral devices to extend battery runtime for critical loads.
"Hot Swap" batteries can be removed via the front panel for easy and safe UPS maintenance.
For business continuity applications requiring long battery runtimes, battery autonomy can be extended up to several hours using ER models (versions 2200 and 3000) fitted with more powerful battery chargers.
Battery test facility to detect deteriorating battery performance.
Deep discharge protection to reduce battery ageing.

Versatility

Vision Dual can be installed as a tower or in 19" rack cabinets. The display panel can be easily removed and rotated to suit the type of installation required.
Vision Dual is equipped with an emergency power off (EPO) contact that allows for remote shutdown in emergency situations.
Cold Start function to allow the UPS to power up with no mains power supply present.
Vision Dual models have a backlit LCD display providing UPS status information, load and battery performance.

Advanced communications

- Advanced multi-platform communications for all operating systems and network environments: PowerShield[3] monitoring and shutdown software included, with SNMP agent, for Windows operating systems 7, 2008, Vista, 2003, XP, Mac OS X, Sun Solaris, Linux, VMWare ESX and other Unix operating systems
- USB or RS232 serial port interface (selectable)
- Expansion slot for SNMP agent interface boards
- Status, measurements, alarms and input, output and battery parameters available on LCD display.

2-YEAR WARRANTY

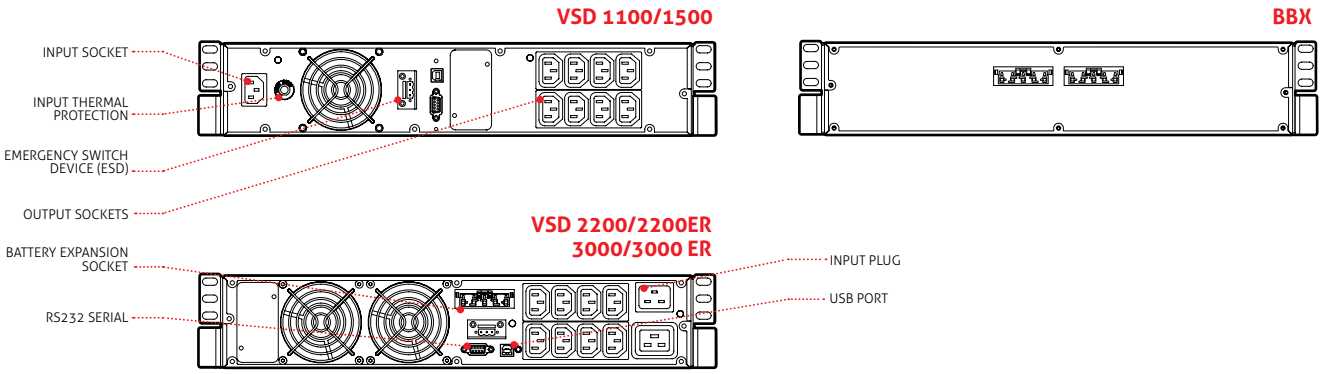
1. REMOVE THE DISPLAY PANEL

2. ROTATE THE DISPLAY PANEL AND INSERT IT INTO POSITION

3. ROTATE THE UPS BY 90°

4. ATTACH THE RACK SUPPORTS

DETAILS



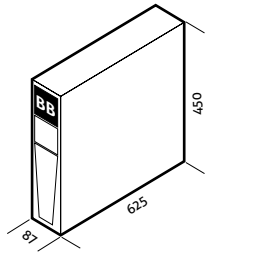
OPTIONS

SOFTWARE
PowerShield[3]
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
Manual Bypass 16 A
Manual Bypass 16 A Rack
Automatic Bypass 16 A
Automatic Bypass 16 A Rack

PRODUCT ACCESSORIES
Universal rails for installation in rack cabinets

BATTERY BOX

MODELS	BB SDH 72-A3 BB SDH 72-M1
Dimensions (mm)	

MODELS	VSD 1100	VSD 1500	VSD 2200	VSD 2200 ER	VSD 3000	VSD 3000 ER
POWER	**1100 VA/990 W**	**1500 VA/1350 W**	**2200 VA/1980 W**	**2200 VA/1760 W**	**3000 VA/2700 W**	**3000 VA/2400 W**
INPUT						
Nominal voltage	220-230-240 Vac					
Voltage range without battery intervention	162 Vac < Vin < 290 Vac					
Maximum permitted voltage	300 V					
Nominal frequency	50 or 60 Hz ±5Hz					
Frequency range	50 Hz ± 5% / 60 Hz ± 5%					
Power factor	> 0.98					
Current distortion	≤7%					
OUTPUT						
Voltage distortion with linear load / with non-linear load	< 3% / < 8%					
Frequency	Selectable: 50 Hz or 60 Hz or self-learning					
Waveform	Sinusoidal					
Current crest factor	2.5 : 1					
Efficiency ECO and Smart Active Modes	98.5%					
BATTERIES						
Type	VRLA AGM maintenance-free lead based					
Recharge time	2-4 hours					
OVERLOAD TIMES						
100% < Load < 110%	5 minutes					
110% < Load < 150%	10 seconds					
Load > 150%	1 second					
OTHER FEATURES						
Net weight (kg)	16.5	17.5	28	15.5	31.5	16.5
Gross weight (kg)	20	21	33	20.5	36.5	21.5
Dimensions (WxDxH) (mm)	87 x 450 x 425 (2U x 19" x 425)		87 x 450 x 625 (2U x 19" x 625)			
Packaged dimensions (WxDxH) (mm)	240 x 500 x 600		240 x 600 x 760			
Protection against overvoltages	300 joules					
Protections	Overcurrent - short-circuit - overvoltage - undervoltage - temperature - excessive low battery					
Communications	USB / DB9 with RS232 and contacts / Slot for communications interface					
Input plugs	1 IEC 320 C14		1 IEC 320 C20			
Output sockets	8 IEC 320 C13		8 IEC 320 C13 + 1 IEC 320 C19			
Standards	Safety: EN 62040-1 and Directive 2006/95/EL; EMC: EN 62040-2 category C2 and Directives 2004/108/EL					
Operating temperature	0 °C / +40 °C					
Relative humidity	<95% non-condensing					
Colour	Black					
Noise level at 1 m	< 40 dBA					
Standard equipment provided	Power cable, serial cable, USB cable, safety manual, quick start guide, user manual on CD-ROM					

SOHO E-MEDICAL INDUSTRY EMERGENCY

VFI TYPE ONLINE

Sentinel Pro

1:1 700-3000 VA

ECO LEVEL

USB plug

GS Nemko certified

Supercaps UPS

Plug & Play installation

HIGHLIGHTS

- **Operating flexibility**
- **Emergency function**
- **Battery optimisation**
- **Runtime expandability**
- **Low noise level**

Sentinel Pro has a unique and modern design and improved performance developed by the Riello UPS research and development team. Sentinel Pro uses on-line double conversion technology, resulting in the highest levels of reliability and maximum protection for critical loads such as servers, and IT and voice/data applications.
For business continuity applications requiring long battery runtimes, battery autonomy can be extended up to several hours using ER models fitted with more powerful battery chargers.
The front display panel has been entirely redesigned, adding an LCD display that shows the input and output voltages, battery readings and UPS operating status information. The inverter and the microprocessor control stage has been completely redesigned to provide increased efficiency and greater configuration options.
Maximum expandability: the Sentinel Pro is supplied as standard with a USB port and an expansion slot for protocol conversion or relay contacts boards.
With energy savings in mind, Sentinel Pro is also fitted with a shut-off button to reduce energy consumption to zero during prolonged periods of inactivity (ECO LINE).
Sentinel Pro is available in 700 VA, 1000 VA, 1500 VA, 2200 VA and 3000 VA models.

Operating flexibility

Different operating modes that can be programmed according to on user requirements and the load to be powered have been introduced in order to reduce energy consumption.

- **On line**: maximum load protection and output voltage waveform quality
- **Economy Mode**: the UPS uses line interactive technology, with the load powered by the mains, reducing consumption and thus improving efficiency (up to 98%).
- **Smart Active Mode**: the UPS automatically selects on-line or line interactive operation, depending on the quality of the mains supply, checking the number, frequency and type of disturbances present.
- **Stand by Off** (emergency): The UPS supplies the load only when the mains fails. The inverter begins working with a progressive start-up sequence to prevent inrush currents.
- **Frequency converter** operation (50 or 60 Hz).

Emergency function

This configuration ensures the operation of emergency systems that must be supplied in the event of a mains power failure, such as emergency lighting, fire detection/ extinguishing systems and alarms. When the mains power supply fails, the inverter begins powering the loads with a progressive start-up (Soft Start) in order to prevent overload. Sentinel Pro is compliant for installation in medium-voltage transformer rooms in accordance with applicable legislation, for the power supply with reserve charge of medium-voltage coils.

Battery optimisation

The Sentinel Pro range has a deep discharge protection device to optimise battery life. Periodically the UPS carries out a battery efficiency test (which can also be manually activated); its wide input voltage tolerance range helps to reduce battery usage and maintain performance over time.

Runtime expandability

Optional battery extension packs can be connected to increase UPS runtime. In addition the Sentinel Pro range includes ER versions with no internal batteries and more powerful battery chargers for longer runtimes.

Low noise level

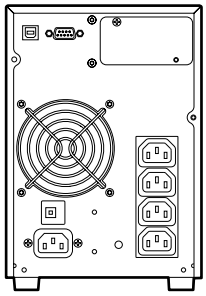
Thanks to the use of high frequency components and load-based fan speed control, the noise produced by the UPS is less than 40 dBA.

Features

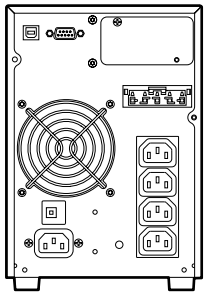
- Filtered, stabilised and reliable voltage: double conversion on-line technology (VFI compliant with IEC 62040-3) with filters for the suppression of atmospheric disturbances.
- High overload capability (up to 150%)
- Programmable Auto-restart when mains is restored
- Battery start-up (cold start)

DETAILS

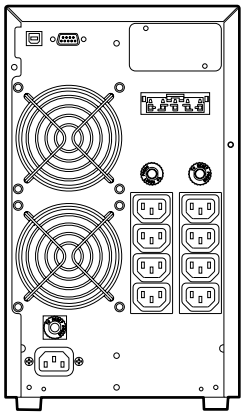
SEP 700
SEP 1500



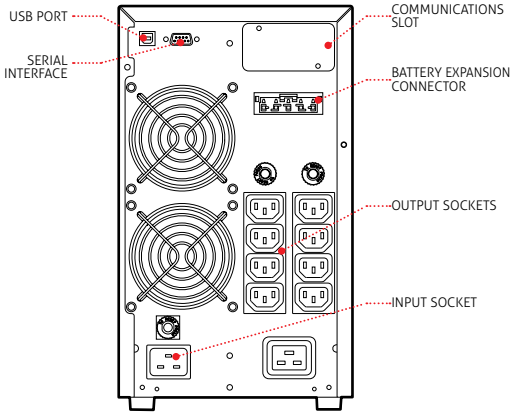
SEP 1000
SEP 1000 ER



SEP 2200
SEP 2200 ER



SEP 3000
SEP 3000 ER



- Power factor correction (UPS input power factor, close to 1)
- Wide input voltage tolerance range (from 140 V to 276 V) without battery intervention.
- Runtime extendable up to several hours
- Fully configurable using UPS Tools configuration software
- Highly reliable batteries (automatic and manually-activated battery test)
- High level of UPS reliability (total microprocessor control)
- Low impact on the mains (sinusoidal take up).

Advanced communications

- Multi-platform communication for all operating systems and network environments: PowerShield³ supervision and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, VMware ESX and other Unix operating systems.
- UPS Tools configuration and customisation software supplied as standard
- RS232 serial port and opto-isolated contacts
- USB port
- Slot for communications boards.

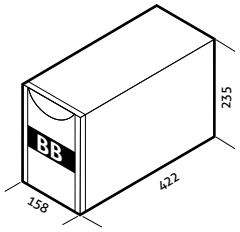
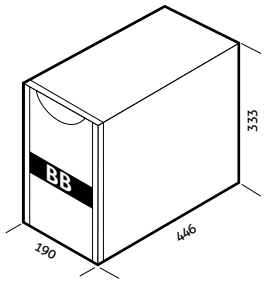
2-YEAR WARRANTY

OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
Manual Bypass 16 A
Automatic Bypass 16 A

BATTERY BOX

MODELS	BB SEP 36-A3 / BB SEP 36-M1	BB SEP 72-A3 / BB SEP 72-M1
Dimensions (mm)		

MODELS	SEP 700	SEP 1000	SEP 1000 ER	SEP 1500	SEP 2200	SEP 2200 ER	SEP 3000	SEP 3000 ER
POWER	**700 VA/560 W**	**1000 VA/800 W**		**1500 VA/1200 W**	**2200 VA/1760 W**		**3000 VA/2400 W**	
INPUT								
Nominal voltage	220-230-240 Vac							
Voltage range without battery intervention	140 Vac < Vin < 276 Vac @50% LOAD / 184 Vac < Vin < 276 Vac @ 100% LOAD							
Maximum permitted voltage	300 Vac							
Nominal frequency	50/60 Hz							
Frequency range	50 Hz ± 5% / 60 Hz ± 5%							
Power factor	> 0.99							
Current distortion	≤7%							
BYPASS								
Voltage tolerance	180 - 264 Vac							
Frequency tolerance	Frequency selected (from ±1.5Hz to ±5Hz configurable)							
OUTPUT								
Voltage distortion with linear load / with non-linear load	< 2% / < 4%							
Frequency	Selectable: 50 Hz or 60 Hz or self-learning							
Static variation	± 1%							
Dynamic variation	≤ 5% in 20 msec.							
Waveform	Sinusoidal							
Current crest factor	3 : 1							
Efficiency ECO and Smart Active Modes	98%							
BATTERIES								
Type	VRLA AGM maintenance-free lead based; Supercaps							
Recharge time	2-4 hours		N.A.	2-4 hours		N.A.	2-4 hours	N.A.
OVERLOAD TIMES								
100% < Load < 110%	2 minutes							
110% < Load < 150%	5 seconds							
Load > 150%	1 second							
OTHER FEATURES								
Net weight (kg)	10,9	13,3	7	14,8	25,6	10,6	28	14
Gross weight (kg)	12,5	14,9	8,6	15,5	28,8	13,8	31,2	17,2
Dimensions (WxDxH) (mm)	158 x 422 x 235				190 x 446 x 333			
Packaging dimensions (WxDxH) (mm)	245 x 500 x 340				325 x 585 x 470			
Protection against overvoltage	300 joules							
Protections	Overcurrent - short-circuit - overvoltage - undervoltage - temperature - excessive low battery							
Communications	USB / DB9 with RS232 and contacts / Slot for communications interface							
Input plugs	1 IEC 320 C14					1 IEC 320 C20		
Output sockets	4 IEC 320 C13				8 IEC 320 C13		8 IEC 320 C13 + 1 IEC 320 C19	
Standards	Safety: EN 62040-1 and Directive 2006/95/EL; EMC: EN 620040-2 category C2 and Directives 2004/108/EL							
Operating temperature	0 °C / +40 °C							
Relative humidity	< 95% non-condensing							
Colour	Black							
Noise level at 1 m	< 40 dBA							
Standard equipment provided	Power cable, IEC-IEC cable, USB cable, safety manual, quick start guide							

Sentinel Dual

Low Power

SOHO · DATACENTER · E-MEDICAL

INDUSTRY · TRANSPORT · EMERGENCY

VFI TYPE
ONLINE

1:1 1-3 kVA

6 ECO LEVEL

USB
USB plug

Hot swap battery

Energy share

P&P
Plug & Play installation

HIGHLIGHTS

- **Simplified installation**
- **Installation versatility**
- **Reduced running costs**
- **Runtime expandability**
- **Low noise level**

Sentinel Dual is the new range of high density double conversion online UPS, suitable for powering a wide range of devices such as servers, storage systems, telephony - VoIP equipment, network and medical systems as well as industrial applications.
It is also ideal for powering and protecting Blade Server systems with high input power factor. At only 2U, Sentinel Dual is ideal for 19" rack cabinet installations.
Sentinel Dual has a practical, modern design and includes several performance advantages over traditional on-line UPS. All developed by the Riello UPS research and development team.
The newly-designed inverter is one of the best energy conversion systems on the market, with a 0.9 output power factor and 92% operating efficiency in on-line mode.
For business continuity applications requiring long battery runtimes, battery autonomy can be extended up to several hours using ER models fitted with more powerful battery chargers.
With energy savings in mind, Sentinel Dual is also fitted with a shut-off button to reduce energy consumption to zero during prolonged periods of inactivity.

1. REMOVE THE DISPLAY PANEL	2. ROTATE THE DISPLAY PANEL AND INSERT IT INTO POSITION	3. ROTATE THE UPS BY 90°	4. ATTACH THE RACK SUPPORTS

Simplified installation

- Sentinel Dual can be installed as a tower or in 19" rack cabinets, by simply removing and rotating the display panel
- Low noise (<40 dBA): can be installed in any environment thanks to its high frequency switching inverter and PWM load-dependent digitally controlled fan.
- Operation guaranteed up to 40°C (the components are designed for high temperatures and are thus subject to less stress at normal temperatures)
- On Sentinel Dual models, the output sockets can be programmed to disconnect less critical loads during blackouts (EnergyShare function).

Installation versatility

Sentinel Dual can be used in a tower or rack format, by simply turning the display and adding the supplied handles or optional runners.

Reduced running costs

The UPS is highly flexible and easy to configure. Programmable functions can be set via software or manually via the front display panel. Sentinel Dual can be configured in the following operating modes:

- **On Line**, maximum load protection and output voltage waveform quality
- **ECO Mode**, to increase efficiency (up to to 98%); allows you to select Line Interactive technology
- **Smart Active**, the UPS automatically decides the operating mode based on the mains power quality
- **Emergency**, the UPS can be selected to function only when the mains power supply fails (emergency only mode)
- **Frequency converter** operation (50 or 60 Hz).

Advanced communications

Sentinel Dual offers maximum flexibility for integration with all types of communication systems.

- Multi-platform communication for all operating systems and network environments: PowerShield³ supervision and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, VMware ESX and other Unix operating systems.
- UPS Tools configuration and customisation software supplied as standard
- RS232 serial port and opto-isolated contacts
- USB port
- Slot for communications boards such as Modbus/Jbus, TCP/IP-SNMP and relay contacts.

Emergency function

This configuration ensures the operation of emergency systems that must be supplied in the event of a mains power failure, such as emergency lighting, fire detection/ extinguishing systems and alarms.
When the mains power supply fails, the inverter begins powering the loads with a progressive start-up (Soft Start) in order to prevent overload.
Sentinel Dual is compliant for installation in medium-voltage transformer rooms in accordance with applicable legislation, for the power supply with reserve charge of medium-voltage coils.

High quality output voltage

- Even with non-linear loads (IT loads with a crest factor of up to 3:1)
- High short circuit current on bypass
- High overload capacity: 150% by inverter (even with mains failure)
- Filtered, stabilised and reliable voltage (On-line double conversion technology (VFI compliant with EN62040-2 class C2) with filters for the suppression of atmospheric disturbances
- Power factor correction: UPS input power factor close to 1 and sinusoidal current uptake.

High battery reliability

- Automatic and manual battery test
- Batteries are user replaceable without switching off equipment and without interruption to the load (Hot Swap)
- Unlimited extendible runtime using matching battery boxes.

Low noise level

Thanks to the use of high frequency components and load-based fan speed control,
the noise produced by the UPS is less than 40 dB.

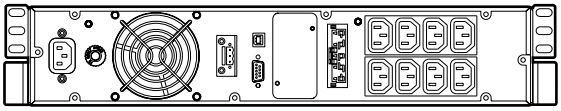
Other features

- Output voltage can be selected via software (220-230-240 V)
- Auto-restart when mains power is restored (programmable via software)
- Stand-by on bypass: when the machine is switched off, it automatically goes into bypass and battery charge mode
- Minimum load switch-off
- Battery discharge warning
- Start-up delay
- Total microprocessor control
- Automatic bypass without interruption
- Status, measurements and alarms available on standard backlit display
- UPS firmware updating via PC
- Input protection via resettable thermal switch (versions up to 1500VA)
- Back-feed protection standard: to prevent energy from being fed back to the network
- Manual switching to bypass.

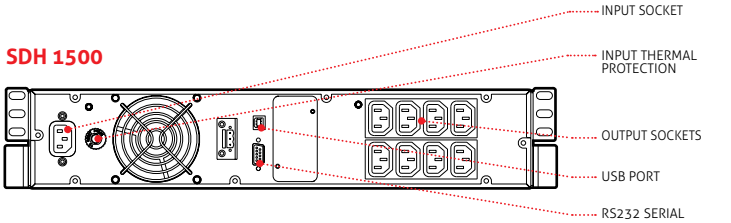
2-YEAR WARRANTY

DETAILS

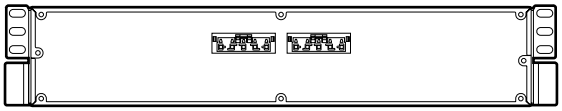
SDH 1000



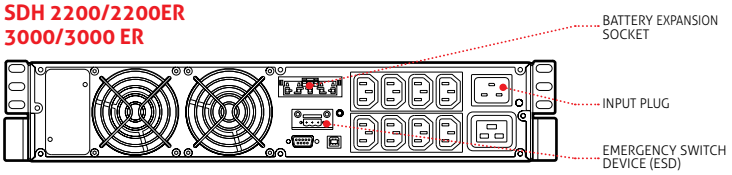
SDH 1500



BB



SDH 2200/2200ER
3000/3000 ER



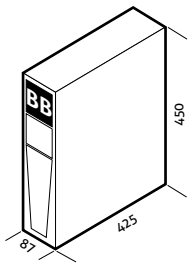
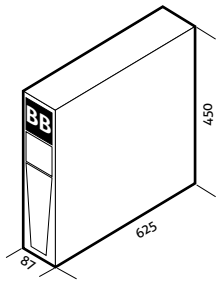
OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
Manual Bypass 16 A
Manual Bypass 16 A Rack
Automatic Bypass 16 A
Automatic Bypass 16 A Rack

PRODUCT ACCESSORIES
Universal rails for installation in rack cabinets

BATTERY BOX

MODELS	BB SDH 36-A3 / BB SDH 36-M1	BB SDH 72-A3 / BB SDH 72-M1
Dimensions (mm)		

MODELS	SDH 1000	SDH 1500	SDH 2200	SDH 2200 ER	SDH 3000	SDH 3000 ER
POWER	**1000 VA/900 W**	**1500 VA/1350 W**	**2200VA/1980 W**	**2200VA/1760 W**	**3000 VA/2700 W**	**3000 VA/2400 W**
INPUT						
Nominal voltage	220-230-240 Vac					
Voltage range without battery intervention	140 Vac < Vin < 276 Vac @50% LOAD / 184 Vac < Vin < 276 Vac @ 100% LOAD					
Maximum permitted voltage	300 V					
Nominal frequency	50/60 Hz ±5Hz					
Frequency range	50 Hz ± 5% / 60 Hz ± 5%					
Power factor	> 0.98					
Current distortion	≤7%					
BYPASS						
Voltage tolerance	200 - 253 Vac					
Frequency tolerance	Frequency selected (from ±0.5Hz to ±5Hz configurable)					
OUTPUT						
Voltage distortion with linear load / with non-linear load	< 2%					
Frequency	Selectable: 50 Hz or 60 Hz or self-learning					
Static variation	± 1%					
Dynamic variation	≤ 5% in 20 msec.					
Waveform	Sinusoidal					
Current crest factor	3 : 1					
Efficiency ECO and Smart Active Modes	98%					
BATTERIES						
Type	VRLA AGM maintenance-free lead based					
Recharge time	2-4 hours					
OVERLOAD TIMES						
100% < Load < 110%	1 minute					
110% < Load < 150%	4 seconds					
Load > 150%	0.5 seconds					
OTHER FEATURES						
Net weight (kg)	17.5	18	30.5	15	31	15
Gross weight (kg)	21	21.5	35	19.5	35.5	19.5
Dimensions (WxDxH) (mm)	(T- 87 x 425 x 450) (R- 19" x 425 x 2U)		(T- 87 x 625 x 450) (R- 19" x 625 x 2U)			
Packaged dimensions (WxDxH) (mm)	550 x 600 x 245		600 x 760 x 245			
Protection against overvoltages	300 joules					
Protections	Overcurrent - short-circuit - overvoltage - undervoltage - temperature - excessive low battery					
Communications	USB / DB9 with RS232 and contacts / Slot for communications interface					
Input plugs	1 IEC 320 C14		1 IEC 320 C20			
Output sockets	8 IEC 320 C13		8 IEC 320 C13 + 1 IEC 320 C19			
Standards	Safety: EN 62040-1 and Directive 2006/95/EL; EMC: EN 620040-2 category C2 and Directives 2004/108/EL					
Operating temperature	0 °C / +40 °C					
Relative humidity	< 95% non-condensing					
Colour	Black					
Noise level at 1 m	< 40 dBA					
Standard equipment provided	Power cable, serial cable, USB cable, safety manual, quick start guide					

Sentinel Dual

High Power

SOHO · DATACENTER · E-MEDICAL

INDUSTRY · TRANSPORT · EMERGENCY

VFI TYPE

ONLINE

1:1 **3:1** 3,3-10 kVA

6 ECO LEVEL

USB
USB plug

Hot swap battery

Energy share

HIGHLIGHTS

- **Simplified installation**
- **Operating mode selection**
- **High quality output voltage**
- **High battery reliability**
- **Emergency function**

Sentinel Dual is the best solution for powering mission critical applications and electro-medical devices requiring maximum power reliability.
Flexibility of installation and use (digital display, user-replaceable battery set), as well as the many communication options available, makes Sentinel Dual suitable for many different applications from IT to security.
Sentinel Dual can be installed on the floor or in rack cabinets for networking applications.
The Sentinel Dual range is available in 3.3-4-5-6-8-10 kVA models with on-line double conversion technology (VFI): the load is powered continuously by the inverter which supplies a sinusoidal voltage, filtered and stabilised in terms of voltage, form and frequency. In addition, the input and output filters significantly increase the load's immunity to mains disturbances and lightning strikes.
Technology and performance: selectable Economy Mode and Smart Active Mode functions. Diagnostics: Standard digital display, RS232 and USB interfaces with PowerShield³ software included, communications slot for connectivity accessories.

1. RELEASE THE DISPLAY PANEL BY APPLYING PRESSURE TO THE CATCHES	2. ROTATE THE DISPLAY PANEL COUNTER CLOCKWISE AND THEN SECURE IT BACK IN PLACE	3. ROTATE THE UPS BY 90°	4. ATTACH THE RACK SUPPORTS

Simplified installation

- Can be installed on the floor (tower version) or in rack mount cabinets (rack version). The display panel can be rotated (using the key supplied)
- Low noise (<40 dBA): can be installed in any environment thanks to its high frequency switching inverter and PWM load-dependent digitally controlled fan.
- External bypass option for maintenance with interruption-free switching (5-6-8-10 kVA SDL)
- Operation guaranteed up to 40°C (the components are designed for high temperatures and are thus subject to less stress at normal temperatures)
- Two built-in IEC output sockets with thermal protection (5-6-8-10 kVA SDL)
- On the 5-6-8-10 kVA models, it is also possible to program two 10 A output sockets when the mains power supply fails (PowerShare function).

Operating mode selection

Functions can be programmed via software or manually via the front display panel.

- **On line**
- **Economy Mode:** to increase efficiency (up to to 98%), allows for the selection of Line Interactive technology (VI) to power low priority loads from the mains supply
- **Smart Active:** the UPS automatically decides upon the operating mode (VI or VFI) based on the quality of the mains power supply
- **Emergency:** the UPS can be selected to function only when the mains power supply fails (emergency only mode).
- **Frequency converter** operation (50 or 60 Hz).

High quality output voltage

- Even with non-linear loads (IT loads with a crest factor of up to 3:1)
- High short circuit current on bypass
- High overload capacity: 150% by inverter (even with mains failure)
- Filtered, stabilised and reliable voltage (double conversion on-line technology (VFI compliant with EN62040-3)), with filters for the suppression of atmospheric disturbances.
- Power factor correction: UPS input power factor close to 1 and sinusoidal current uptake.

High battery reliability

- Automatic and manual battery test
- Reduced ripple component (detrimental to the batteries) using a low ripple current discharge (LCRD) system
- Batteries are user replaceable without switching off equipment and without interruption to the load (Hot Swap)
- Unlimited extendible runtime using matching Battery Boxes
- The batteries do not cut in during mains failures of <40 ms (high hold up time) or when the input supply is between 84 V to 276 V.

Emergency function

This configuration ensures the operation of those emergency systems that require continuous, reliable and long-lasting power supply in the event of a mains power failure, such as emergency lighting, fire detection/ extinguishing systems and alarms. When the mains power supply fails, the inverter begins powering the loads with a progressive start-up (Soft Start) in order to prevent overload.

Battery optimisation

The wide input voltage range and a high hold-up time minimise battery usage and increase efficiency and battery life; for smaller power breaks, energy is drawn from a group of appropriately-sized capacitors.

EnergyShare (5-10 kVA versions)

Two 10 A configurable IEC output sockets allow for runtime optimisation by programming the switching off of low priority loads on mains failure; alternatively, emergency loads that are normally not powered when mains is present can be activated.

Other features

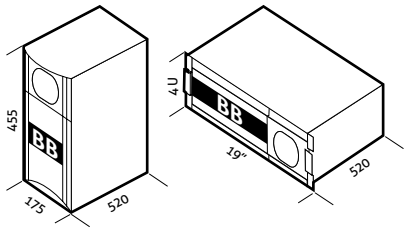
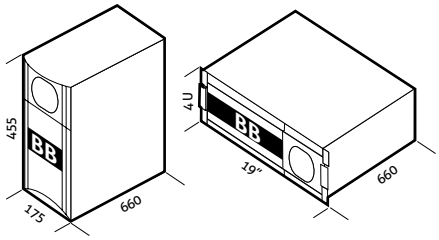
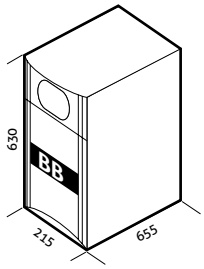
- Selectable output voltage (220-230-240 V)
- Auto-restart when mains power is restored (programmable via software)
- Bypass on: when the machine is switched off, it automatically goes into bypass and battery charge mode
- Minimum load switch-off
- Low battery warning
- Start-up delay
- Total microprocessor control
- Automatic bypass without interruption
- Use of IMS modules (Insulated Metallic Substrates)
- Status, measurements and alarms available on standard backlit display
- UPS digital updating (flash upgradeable)
- Input protection via resettable thermal switch
- Back-feed protection standard: to prevent energy from being fed back to the network
- Manual switching to bypass.

Advanced communications

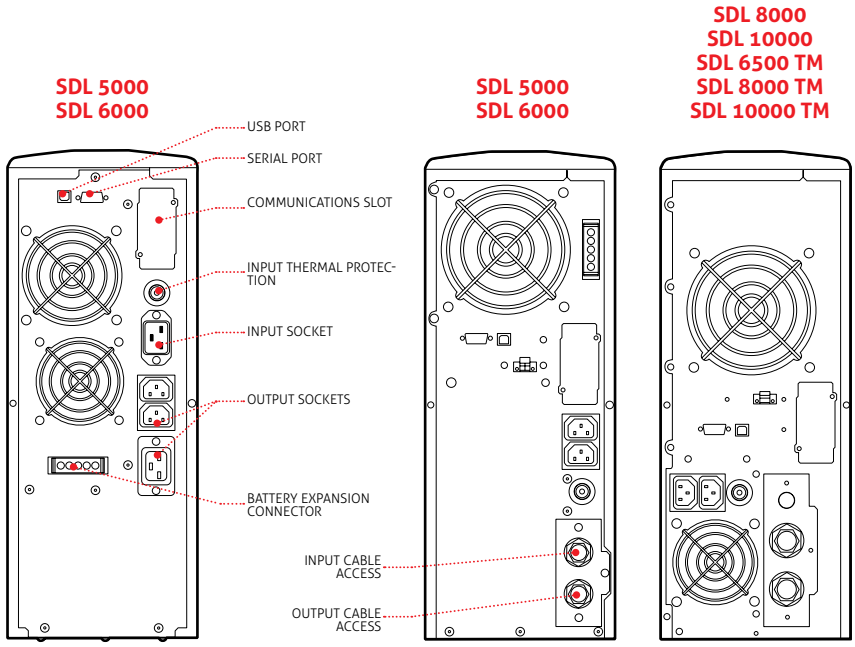
- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, Linux, VMWare ESX and other Unix operating systems
- Plug and play function
- USB port
- RS232 serial port
- Slot for installation of communications boards.

2-YEAR WARRANTY

BATTERY BOX

MODELS	BB SDL 108-A4 / BB SDL 108-M1	BB SDL 192-A3/ BB SDL 192-A6	BC SDL 108-B1
Dimensions (mm)			

DETAILS



OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
Manual Bypass 16 A Ⓛ
Manual bypass 16 A Rack Ⓛ
Automatic bypass 16 A Ⓛ
Automatic bypass 16 A Rack Ⓛ

PRODUCT ACCESSORIES
Universal rails for installation in rack cabinets

Note: Ⓛ *3300-4000 VA*

MODELS	SDL 3300	SDL 4000	SDL 5000	SDL 6000	SDL 8000	SDL 10000
POWER	**3300 VA/2300 W**	**4000 VA/2400 W**	**5000 VA/3500 W**	**6000 VA/4200 W**	**8000 VA/7200 W**	**10000 VA/9000 W**
INPUT						
Nominal voltage	220-230-240 Vac					
Minimum voltage	164 Vac @ 100% load / 84 Vac @ 50% load					
Nominal frequency	50/60 Hz ±5Hz					
Power factor	> 0.98					
Current distortion	≤7%					
BYPASS						
Voltage tolerance	180 - 264 Vac (selectable in Economy Mode or Smart Active Mode)					
Frequency tolerance	Selected frequency ±5% (selectable by user)					
OUTPUT						
Nominal voltage	220-230-240 Vac selectable					
Voltage distortion	< 3% with linear load / < 6% with non-linear load					
Frequency	50/60 Hz selectable					
Static variation	1,5%					
Dynamic variation	≤ 5% in 20 ms					
Waveform	Sinusoidal					
Crest factor	3 : 1					
BATTERIES						
Type	VRLA AGM maintenance-free lead based					
Recharge time	4-6 hours					
OVERLOAD TIMES						
100% < Load < 110%	1 minute					
110% < Load < 150%	4 seconds					
Load > 150%	0.5 seconds					
OTHER FEATURES						
Net weight (kg)	38	40	62	64	94	95
Gross weight (kg)	42.5	44.5	70	72	102	103
Dimensions (WxDxH) (mm)	175 x 520 x 455 tower 19" x 520 x 4U rack		175 x 660 x 455 tower 19" x 660 x 4U rack		2 x (175 x 660 x 455) tower 2 x (19" x 660 x 4U) rack	
Packaged dimensions (WxDxH) (mm)	540 x 620 x 280		720 x 530 x (270+15)		780 x 555 x (270+15)	
Efficiency Line-interactive/Smart Active	98%					
Protections	Overcurrent - short-circuit - overvoltage - undervoltage - temperature - excessive low battery					
Communications	USB / RS232 + slot for communications interface					
Input plugs	1 IEC 320 C20		Terminal board			
Output sockets	2 IEC 320 C13 + 1 IEC 320 C20		Terminal board + 2 IEC 320 C13			
Standards	EN 62040-1 EMC EN 62040-2 Directives 73/23 - 93/68 - 2004/108 EC EN 62040-3					
Operating temperature	0 °C / +40 °C					
Relative humidity	< 95% non-condensing					
Colour	Dark grey RAL 7016					
Noise level at 1 m	< 40 dBA		< 45 dBA			
Standard equipment provided	2 10 A cables; 1 IEC-16 A plug; software; serial cable; keys for releasing display panel; handles kit		2 cable guides; cable tips; software; serial cable; keys for releasing display panel; handles kit			

MODELS	SDL 6500 TM	SDL 8000 TM	SDL 10000 TM
POWER	**6500 VA/5850 W**	**8000 VA/7200 W**	**10000 VA/9000 W**
INPUT			
Nominal voltage	400 Vac three-phase + N		
Minimum voltage (F + N)	164 Vac @ 100% load / 84 Vac @ 50% load		
Nominal frequency	50/60 Hz ±5 Hz		
Power factor	> 0.95		
BYPASS			
Voltage tolerance	180 - 264 Vac (selectable in Economy Mode or Smart Active Mode)		
Frequency tolerance	Selected frequency ±5% (selectable by user)		
OUTPUT			
Nominal voltage	220-230-240 Vac selectable		
Voltage distortion	< 3% with linear load / < 6% with non-linear load		
Frequency	50/60 Hz selectable		
Static variation	1,5%		
Dynamic variation	≤ 5% in 20 ms		
Waveform	Sinusoidal		
Crest factor	3 : 1		
BATTERIES			
Type	VRLA AGM maintenance-free lead based		
Recharge time	4-6 hours		
OVERLOAD TIMES			
100% < Load < 110%	1 minute		
110% < Load < 150%	4 seconds		
Load > 150%	0.5 seconds		
OTHER FEATURES			
Net weight (kg)	91	94	95
Gross weight (kg)	99	102	103
Dimensions (WxDxH) (mm)	2 x (175 x 660 x 455) tower / 2 x (19" x 660 x 4U) rack		
Packaged dimensions (WxDxH) (mm)	780 x 555 x (270+15)		
Smart Active efficiency	up to 98%		
Protections	Overcurrent - short-circuit - overvoltage - undervoltage - temperature - excessive low battery		
Communications	USB / RS232 + slot for communications interface		
Input plugs	Terminal board		
Output sockets	Terminal board + 2 IEC 320 C13		
Standards	EN 62040-1 EMC EN 62040-2 Directives 73/23 - 93/68 - 2004/108 EC EN 62040-3		
Operating temperature	0 °C / +40 °C		
Relative humidity	< 95% non-condensing		
Colour	Dark grey RAL 7016		
Noise level at 1 m	< 45 dBA		
Standard equipment provided	2 cable guides; cable tips; software; serial cable; keys for releasing display panel; handles kit		

52
100
0

Sentinel Power Green

SOHO · DATACENTER · E-MEDICAL

INDUSTRY · TRANSPORT · EMERGENCY

VFI TYPE
ONLINE

1:1 6 kVA

1:1 **3:1** 8-20 kVA

6 ECO LEVEL

USB
USB plug

Energy share

service
Service 1st start

HIGHLIGHTS

- **Small footprint**
- **Power factor 0.9**
- **High efficiency 97%**
- **Parallelable 1+1**
- **Simplified installation**
- **High quality output voltage**

Sentinel Power Green is the ideal solution for protecting IT systems, telecommunications equipment and mission critical systems such as safety devices, ensuring maximum power reliability.
Sentinel Power Green is designed and built using state-of-the-art technology and components to provide maximum protection to the powered loads with no impact on downstream systems and optimised energy savings.
The series includes 6 kVA single/single-phase and 8-20 kVA single/single-phase and three/single-phase models with on-line double conversion technology (VFI): the load is powered continuously by the inverter which supplies a sinusoidal voltage, filtered and stabilised in terms of form and frequency.
Input and output filters provide significant further immunity from mains disturbances and lightning strikes.
In terms of technology and performance, Sentinel Power Green is one of the best UPS available on the market today: selectable Economy Mode and Smart Active Mode functions; custom diagnostics LCD display, RS232 and USB interfaces with Powershield[3] software, ESD input, interface slot with optional boards.

High UPS reliability
- Total microprocessor control.
- Interruption-free static and manual bypass.
- Specifications guaranteed up to 40°C (the components are designed to work at high temperatures and thus are subject to less stress at normal temperatures).

Parallelable
Parallel configuration of 2 units for (1+1) redundant or power parallel system. The UPS continue to operate in parallel even if the connection cable is interrupted (Closed Loop).

Operating mode selection
The operating mode can be programmed via software or manually via the front display panel.
- **On line:** double conversion Mode: for critical applications.
- **Economy Mode:** to increase efficiency (up to to 98%), allows for the selection of Line Interactive technology (VI) to power low priority loads from the mains supply.
- **Smart Active:** the UPS automatically decides upon the operating mode (VI or VFI) based on the quality of the mains power supply.
- **Emergency:** the UPS can be selected to function only when the mains power supply fails (emergency only mode).
- **Frequency converter** operation (50 or 60 Hz).

High quality output voltage
- Even with non-linear loads (IT loads with a crest factor of up to 3:1).
- High short circuit current on bypass.
- High overload capacity: 150% by inverter (even with mains failure).
- Filtered, stabilised and reliable voltage (double conversion on-line technology - VFI compliant with EN62040-3), with filters for the suppression of atmospheric disturbances.
- Power factor correction: UPS input power factor close to 1 and sinusoidal current uptake.

Simplified installation
- UPS can be installed on a single-phase or three-phase distribution network.
- Output terminal board + 2 IEC sockets for powering local consumers (computers, modems, etc.).
- Simplified positioning (built-in castors).

High battery reliability
- Automatic and manual battery test.
- Proper battery care is critical to ensuring correct UPS operation in emergency conditions. The Riello UPS battery care system consists of a series of features and capabilities to optimise battery management and obtain the best performance and operating life possible.
- Unlimited extendible runtime using matching Battery Boxes.
- The batteries do not cut in during mains failures of <40 ms (high hold up time) or when the input supply is between 84 V to 276 V.

Low impact on the mains
Sinusoidal uptake of input current on single-phase/single-phase series.

Other features
- Advanced diagnostics: status, measurements and alarms available on custom LCD display.
- Low noise (<40 dBA): can be installed in any environment thanks to its high frequency switching inverter and PWM load-dependent digitally controlled fan (>20 kHz, value above audible range).
- Auto restart (automatic when mains supply is restored, programmable via software or display panel).
- Emergency function: the UPS can be selected to function only when the mains power supply fails (emergency lights).
- Back-feed protection standard: to prevent energy from being fed back to the network.
- UPS digital updating (flash upgradeable).

Advanced communications
- Compatible with Riello UPS TeleNetGuard remote monitoring.
- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, VMWare ESX and other Unix operating systems.
- RS232 serial and USB ports.
- Plug and play function.
- Slot for installation of communications boards.

OPTIONS

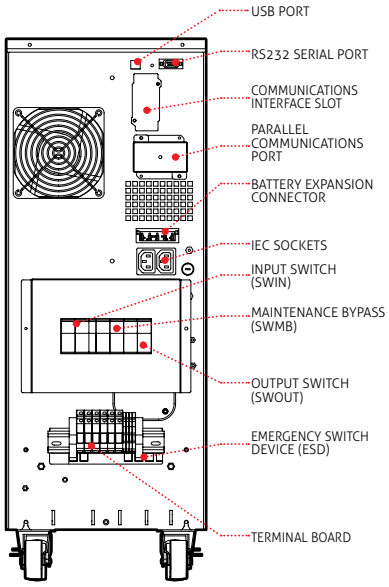
SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
Manual Bypass MBB 100 A

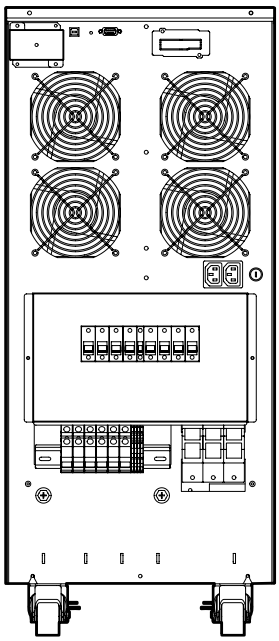
PRODUCT ACCESSORIES
Isolation transformer module (hlp) mm/kg: 500 x 400 x 265 / 80 (only for 5000-6000 VA models)

DETAILS

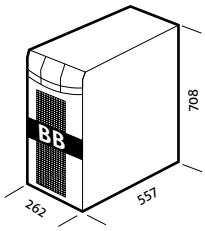
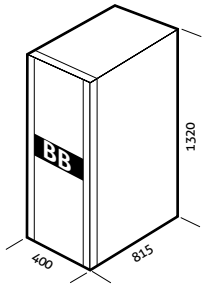
SPM 6 - SPH 8



SPH 10 - SPH 15 - SPH 20



BATTERY BOX

MODELS	BB SPM 180-A3 / BB SPM 180-M1 BB SPH 240-A3 / BB SPH 240 M1	BB MST 1320 480
Dimensions (mm)		

MODELS	SPM 6	SPH 8	SPH 10	SPH 10 ER	SPH 15	SPH 20	SPH 20 ER
POWER	**6000 VA/ 5400 W**	**8000 VA/ 6400 W**	**10000 VA/ 9000 W**	**10000 VA/ 9000 W**	**15000 VA/ 13500 W**	**20000 VA/ 18000 W**	**20000 VA/ 18000 W**
INPUT							
Nominal voltage	220-230-240 Vac 1 ph	220-230-240 Vac 1 ph / 380-400-415 Vac 3 ph + N					
Minimum voltage without battery intervention	176 Vac @ 100% load / 110 Vac @ 50% load						
Maximum operating voltage	276 Vac						
Nominal frequency	50/60 Hz ±10 Hz						
BYPASS							
Voltage tolerance	160 - 276 Vac (selectable in Economy Mode or Smart Active Mode)						
Frequency tolerance	Selected frequency ±10%						
OUTPUT							
Nominal voltage	220-230-240 Vac selectable						
Voltage distortion	< 2% with linear load / < 5% with non-linear load						
Current distortion	3 %						
Frequency	50/60 Hz selectable or with automatic selection						
Static variation	± 1,5 %						
Dynamic variation	≤ 5% in 20 ms						
Waveform	Sinusoidal						
Crest factor	≥ 3 : 1						
BATTERIES							
Type	VRLA AGM maintenance-free lead based						
Recharge time	6-8 hours						
Recharge current (only for ER versions)	n.a.			8 A	n.a.		8 A
OVERLOAD TIMES							
100% < Load < 110%	5 min						
110% < Load < 130%	1 min						
130% < Load < 150%	10 sec						
Load > 150%	0.1 sec						
OTHER FEATURES							
Net weight (kg)	63	78	84	88	140	157	48
Gross weight (kg)	77	92	92	42	164	175	66
Dimensions (WxDxH) (mm)	262 x 557 x 708					350 x 653 x 818	
Packaged dimensions (WxDxH) (mm)	720 x 428 x 970					870 x 475 x 1075	
Smart Active efficiency	up to 98%						
Protections	Overcurrent - short-circuit - overvoltage - undervoltage - temperature - excessive low battery						
Communications	USB / RS232 + slot for communications interface						
Parallel	max. 2 units in parallel with optional kit						
Input plugs	Terminal board						
Output sockets	Terminal board + 2 IEC 320 C13						
Standards	EN 62040-1 EMC EN 62040-2 Directives 2006/95/EC - 2004/108 EC EN 62040-3						
Operating temperature	0 °C / +40 °C						
Relative humidity	< 95% non-condensing						
Colour	Dark grey RAL 7016						
Noise level at 1 m	< 56 dBA						
Moving the UPS	castors						

Sentinel Power

SOHO DATACENTER E-MEDICAL

INDUSTRY TRANSPORT EMERGENCY

VFI TYPE
ONLINE

1:1 5-6 kVA

1:1 **3:1** 6,5-10 kVA

ECO LEVEL 6

USB
USB plug

Supercaps UPS

Energy share

service
Service 1st start

HIGHLIGHTS

- **High UPS reliability**
- **Operating mode selection**
- **High quality output voltage**
- **Simplified installation**
- **High battery reliability**
- **Low impact on the mains**

Sentinel Power is the ideal solution for powering sensitive, mission critical systems such as safety devices (electro-medical devices), ensuring maximum power reliability. The series includes 5-6 kVA single/single-phase and 6.5-8-10 kVA single/single-phase and three/single-phase models with on-line double conversion technology (VFI): the load is powered continuously by the inverter which supplies a sinusoidal voltage, filtered and stabilised in terms of voltage, form and frequency.
Input and output filters provide significant further immunity from mains disturbances and lightning strikes.
In terms of technology, performance (selectable Economy and Smart Active Modes) and diagnostics (LCD custom display, RS232 and USB interfaces with Powershield[3] software included, ESD input, interface slot for optional boards), Sentinel Power is one of the best UPS available on the market.

High UPS reliability

- Total microprocessor control.
- Interruption-free static and manual bypass.
- Specifications guaranteed up to 40 °C (the components are designed to work at high temperatures and thus are subject to less stress at normal temperatures).

Operating mode selection

The operating mode can be programmed via software or manually via the front display panel.

- **On line.**
- **Economy Mode:** to increase efficiency (up to to 98%), allows for the selection of Line Interactive technology (VI) to power low priority loads from the mains supply.
- **Smart Active**: the UPS automatically decides upon the operating mode (VI or VFI) based on the quality of the mains power supply.
- **Emergency:** the UPS can be selected to function only when the mains power supply fails (emergency only mode).
- **Frequency converter** operation (50 or 60 Hz).

High quality output voltage

- Even with non-linear loads (IT loads with a crest factor of up to 3:1).
- High short circuit current on bypass.
- High overload capacity: 150% by inverter (even with mains failure).
- Filtered, stabilised and reliable voltage (double conversion on-line technology - VFI compliant with EN62040-3), with filters for the suppression of atmospheric disturbances.
- Power factor correction: UPS input power factor close to 1 and sinusoidal current uptake.

Simplified installation

- UPS can be installed on a single-phase or three-phase distribution network
- Output terminal board + 2 IEC sockets for powering local consumers (computers, modems, etc.)
- Simplified positioning (built-in castors).

High battery reliability

- Automatic and manual battery test
- Reduced ripple component (detrimental to the batteries) using a low ripple current discharge (LCRD) system
- Unlimited extendible runtime using matching Battery Boxes
- The batteries do not cut in during mains failures of <40 ms (high hold up time) or when the input supply is between 84 V to 276 V.

Energy-share

Two 10 A configurable IEC output sockets allow for runtime optimisation by programming the switching off of low priority loads on mains failure; alternatively, emergency loads that are normally not powered when mains is present can be activated.

Low impact on the mains

Sinusoidal uptake of input current on single-phase/single-phase series.

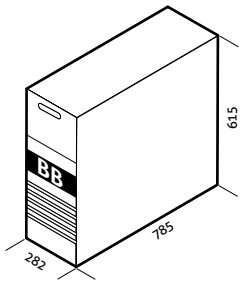
Other features

- Advanced diagnostics: status, measurements and alarms available on custom LCD display
- Low noise (<40 dBA): can be installed in any environment thanks to its high frequency switching inverter and PWM load-dependent digitally controlled fan (>20 kHz, value above audible range)
- Auto restart (automatic when mains supply is restored, programmable via software or display panel)
- Emergency function: the UPS can be selected to function only when the mains power supply fails (emergency lights)
- Back-feed protection standard: to prevent energy from being fed back to the network
- UPS digital updating (flash upgradeable).

Advanced communications

- Compatible with Riello UPS TeleNetGuard remote monitoring
- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, Linux, VMWare ESX and other Unix operating systems
- RS232 serial port
- Plug and play function
- Slot for installation of communications boards.

BATTERY BOX

MODELS	BB SPW 240-A3 / BB SPW 240-A6 BC SPW 240-M1/ BC SPW 240-M4
Dimensions (mm)	

OPTIONS

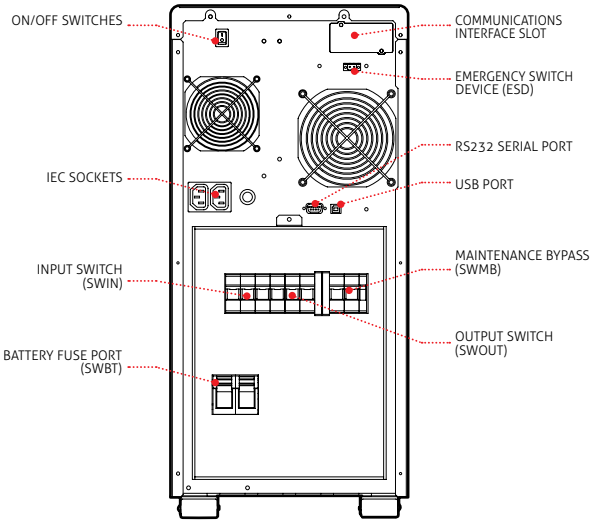
SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
Manual Bypass MBB 100 A

PRODUCT ACCESSORIES
Isolation transformer module (hlp) mm/kg: 500 x 400 x 265 / 80 (only for 5000-6000 VA models)

DETAILS

SPW 5000 - SPW 6000
SPW 6500 - SPT 8000 - SPW 10000



MODELS	SPW 5000	SPW 6000	SPT 6500	SPT 8000	SPT 10000
POWER	**5000 VA/4000 W**	**6000 VA/4800 W**	**6500 VA/5200 W**	**8000 VA/6400 W**	**10000 VA/8000 W**
INPUT					
Nominal voltage	220-230-240 Vac single-phase		220-230-240 Vac single-phase or 380-400-415 Vac three-phase + N		
Minimum voltage without battery intervention	170 Vac @ 100% load / 140 Vac @ 50% load				
Nominal frequency	50/60 Hz ±5 Hz				
BYPASS					
Voltage tolerance	180 - 264 Vac (selectable in Economy Mode or Smart Active Mode)				
Frequency tolerance	Selected frequency ±5%				
OUTPUT					
Nominal voltage	220 - 230 - 240 Vac selectable				
Voltage distortion	< 3% with linear load / < 6% with non-linear load				
Frequency	50/60 Hz selectable or with automatic selection				
Static variation	± 1,5 %				
Dynamic variation	≤ 5% in 20 ms				
Waveform	Sinusoidal				
Crest factor	≥ 3 : 1				
BATTERIES					
Type	VRLA AGM maintenance-free lead based				
Recharge time	6-8 hours				
OVERLOAD TIMES					
100% < Load < 125%	1 minute				
125% < Load < 150%	4 seconds				
Load > 150%	0.5 seconds				
OTHER FEATURES					
Net weight (kg)	91		92	105	106
Gross weight (kg)	99		100	110	111
Dimensions (WxDxH) (mm)	282 x 785 x 615				
Packaged dimensions (WxDxH) (mm)	863 x 388 x (650+15)				
Smart Active efficiency	up to 98%				
Protections	Overcurrent - short-circuit - overvoltage - undervoltage - temperature - excessive low battery				
Communications	USB / RS232 + slot for communications interface				
Input plugs	Terminal board				
Output sockets	Terminal board + 2 IEC 320 C13				
Standards	EN 62040-1 EMC EN 62040-2 Directives 2006/95/EC - 2004/108 EC EN 62040-3				
Operating temperature	0 °C / +40 °C				
Relative humidity	< 95% non-condensing				
Colour	Dark grey RAL 7016				
Noise level at 1 m	< 45 dBA				
Moving the UPS	castors				

DATACENTER E-MEDICAL INDUSTRY TRANSPORT EMERGENCY

VFI TYPE ONLINE

Multi Sentry

1:1 **3:1** 10-20 kVA

3:3 10-120 kVA

6 ECO LEVEL

USB
USB plug

SmartGrid ready

Supercaps UPS

Energy share

service
Service 1st start

HIGHLIGHTS

- **Complete range 10-120 kVA**
- **Small footprint**
- **High efficiency up to 96.5%**
- **Zero impact source**
- **Flexibility of use**
- **Advanced communications**

The Multi Sentry series is ideal for protecting data centres and telecommunications systems, IT networks and critical systems in general, where the risks connected with poor energy supply can compromise the continuity of activities and services.
The Multi Sentry series is available in 10-12-15-20 kVA models with three-phase/single-phase input and single-phase output, and 10-12-15-20-30-40-60-80-100-120 kVA models with three-phase input and output and on-line double conversion technology in accordance with VFI-SS-111 classification (as set out in standard IEC EN 62040-3).

Multi Sentry is designed and built using state-of-the-art technology and components. It is controlled by a DSP (Digital Signal Processor) microprocessor, to provide maximum protection to the powered loads with no impact on downstream systems, and optimised energy savings.
Its highly flexible design allows full compatibility with both three-phase and single-phase power supplies, thus eliminating problems in connecting the UPS to the system.

Zero impact source

Multi Sentry solves installation problems in systems where the power supply has limited

power available, where the UPS is supported by a generator or where there are compatibility problems with loads that generate harmonic currents; Multi Sentry has a zero impact on its power source, whether this is the mains power supply or a generator:

- input current distortion < 3%
- input power factor 0.99
- power walk-in function that ensures progressive rectifier start up
- start-up delay function, to restart the rectifiers when mains power is restored if there are several UPS in the system.

In addition, Multi Sentry plays a filtering and power factor correction role in the power network upstream of the UPS, as it eliminates harmonic components and reactive power generated by the power utilities.

High output

State-of-the-art three-level NPC inverters are used to achieve an operating efficiency of 96.5%. This technology halves (50%) the energy dissipated in a year by traditional UPS, with an efficiency level of 92%. Its exceptional performance makes it possible to recover the capital investment cost in less than three years of operation.

Battery care system

Proper battery care is critical to ensuring correct UPS operation in emergency conditions. The Riello UPS battery care system consists of a series of features and capabilities to optimise battery management and obtain the best performance and operating life possible.

Battery recharging: Multi Sentry is suitable for use with hermetically sealed lead-acid (VRLA), AGM and GEL batteries and Open Vent and Nickel Cadmium batteries.

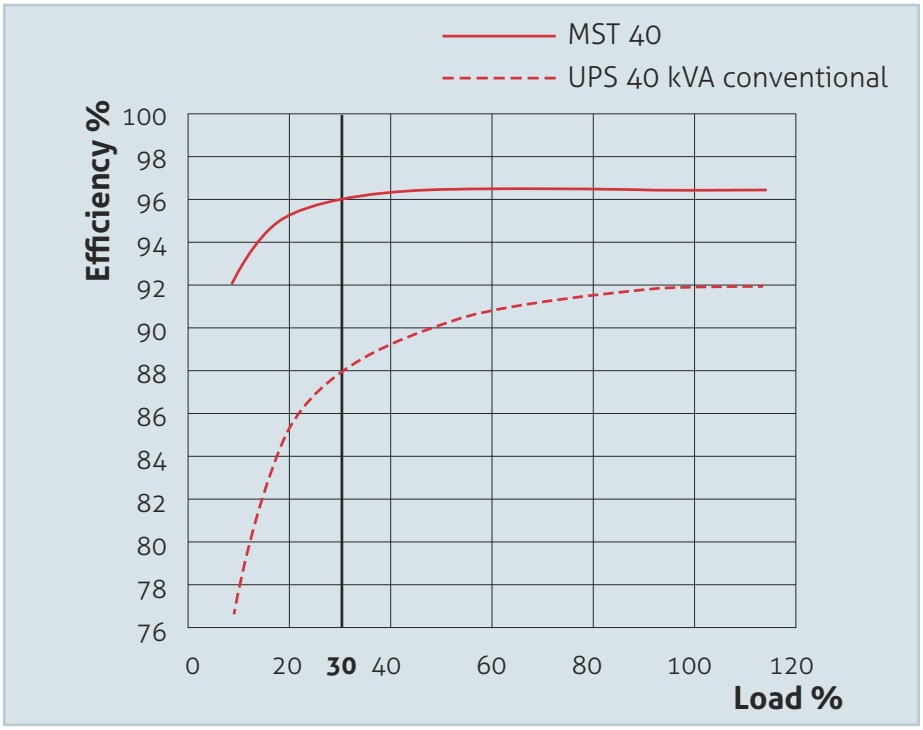
Depending on the battery type, different charging methods are available:

- One-level voltage recharge, typically used for widely available VRLA AGM batteries
- Two-level voltage recharge according to IU specification
- Charge blocking system to reduce electrolyte consumption and lengthen the life of VRLA batteries.

Recharge voltage compensation based on temperature in order to prevent excessive battery charges or overheating.

Battery tests to diagnose in advance any reduction in performance or problems with the batteries.

Deep discharge protection: during extended low-load discharges, the end-of-discharge voltage is increased - as recommended by battery manufacturers - to prevent damage or reduced battery performance.



Ripple current: recharge ripple current (residual AC component) is one of the main causes of reduced reliability and battery life. Using a high frequency battery charger, Multi Sentry reduces this value to negligible levels, prolonging battery life and maintaining high performance over a long period of time.

Wide voltage range: the rectifier is designed to operate within a wide input voltage range (up to - 40% at half load), reducing the need for battery discharge and thus helping to extend battery life.

Maximum reliability and availability

Distributed parallel configuration of up to 6 units per redundant (N+1) or power parallel system. The UPS continue to operate in parallel even if the connection cable is interrupted (Closed Loop).

Low running costs

Advanced technology and use of high performance components, allows Multi Sentry to provide exceptional performance and efficiency, with a compact size:

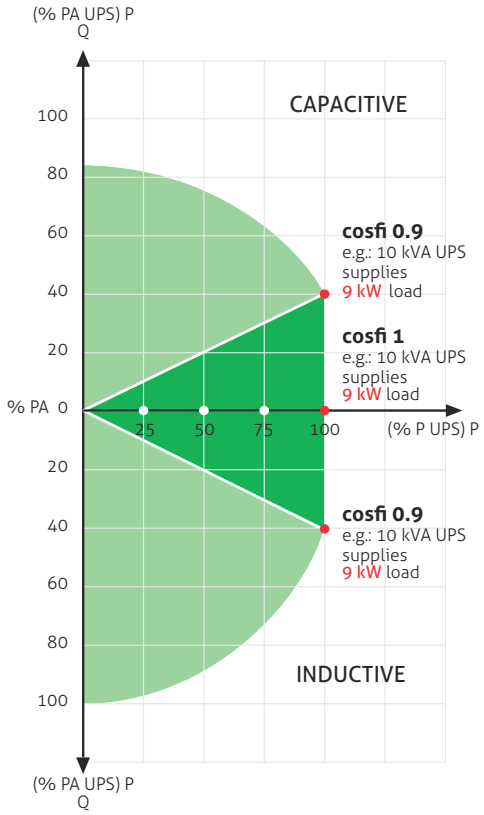
- the smallest overall footprint is only 0.26 sqm for Multi Sentry 20 kVA with batteries
- the type of input stage (IGBT rectifier) ensures an input power factor close to 1 with low current distortion, avoiding the need for bulky and expensive filters
- output power factor of 0.9 providing up to 15% more active power than a traditional UPS, guaranteeing a greater margin when

sizing UPS for potential future load increases.

Flexibility

With its flexible configuration, performance, accessories and options, Multi Sentry is suitable for use in a wide range of applications:

- suitable for powering capacitive loads, such as blade servers, without any reduction in active power from 0.9 lead to 0.9 lag
- On-line, Eco, Smart Active and Stand By Off operating modes - compatible with centralised power systems (CSS) applications.
- frequency converter mode
- configurable EnergyShare sockets to preserve runtime for the most critical loads or to be activated only when mains power fails
- Cold Start to switch on the UPS even when there is no mains power present
- MST/MSM version: cabinet (1320 x 440 x 850mm HxWxD) for optimised solutions when medium to long-term runtimes are required.
- optional temperature sensor for external battery cabinets, to assist recharge voltage compensation
- high power battery chargers to optimise charge time in the event of long runtimes
- optional dual input mains power supply
- isolation transformers for modifying the neutral earthing (separate power sources), or for galvanic isolation between the input and output
- 220 V three-phase IN/OUT version and 50/60 Hz frequency for 10-40 kVA power ratings
- different sized battery cabinets and capacities, for extended runtimes
- with the MST 60-100 the UPS can be raised up to 25 cm from the ground to allow the cables to pass more freely to/ from the UPS terminal board.



Advanced communications

Multi Sentry is equipped with a back-lit graphic display (240x128 pixels) providing UPS information, measurements, operating states and alarms in different languages. It can also display wave forms and voltage/ current forms.

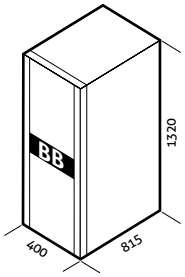
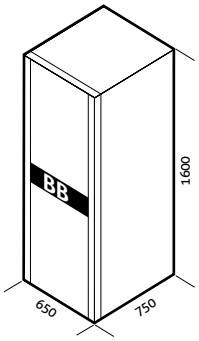
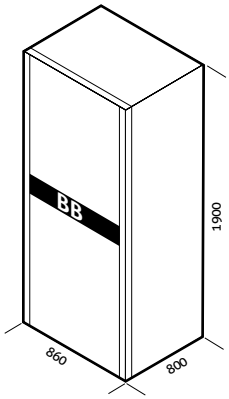
MST 60-100 with Socle box (h: 1850 mm)

The default screen displays UPS status, graphically indicating the status of the various assemblies (rectifier, batteries, inverter, bypass).

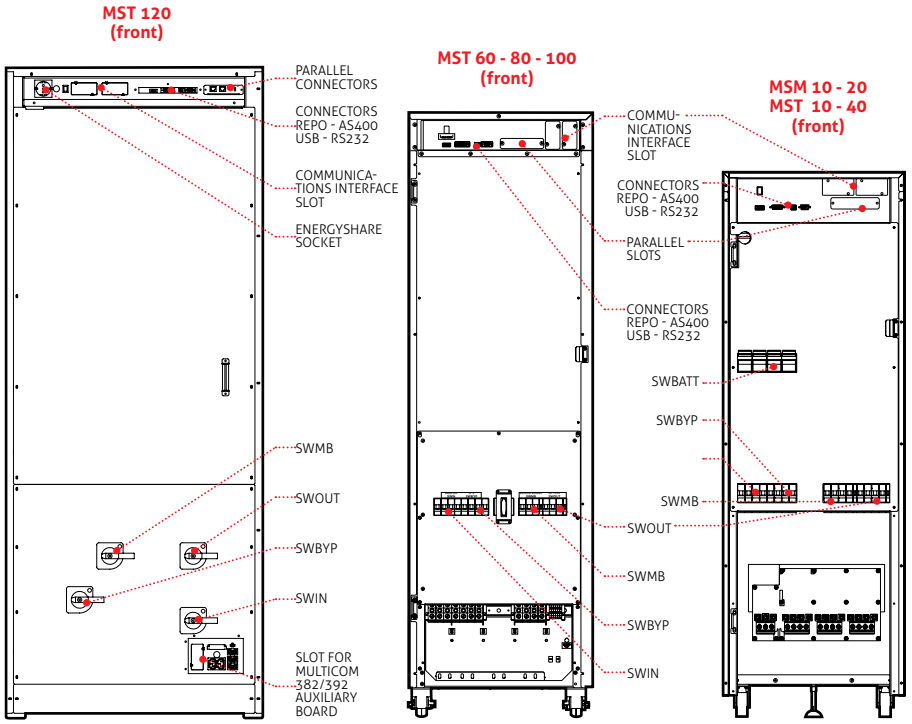
- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software included for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, Linux, VMWare ESX and other Unix operating systems
- Compatible with TeleNetGuard remote monitoring service
- RS232 serial and USB ports
- 3 slots for the installation of optional communications accessories such as network adapters, potential free contacts, etc.
- REPO Remote Emergency Power Off for switching off the UPS via a remote emergency button
- Input for the connection of the auxiliary contact of an external manual bypass
- Input for synchronisation from an external source
- Graphic display panel for remote connection.

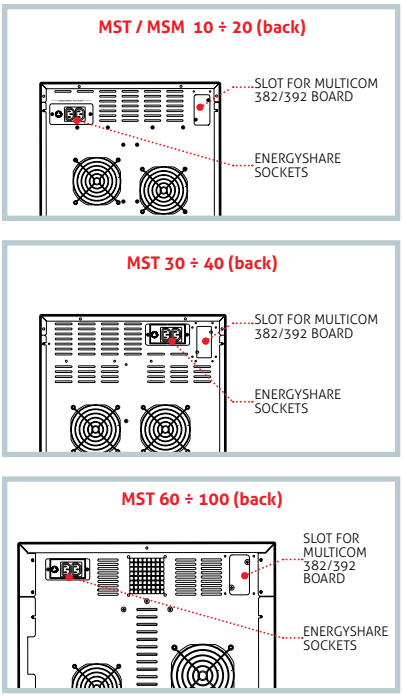
Multi Sentry Compact (MCM/MCT)

BATTERY BOX

MODELS	BB 1320 480-T4 / BB 1320 480-T5 BB 1320 480-T2 / AB 1320 480-T5	BB 1600 480-S5 / AB 1600 480-S5	BB 1900 480-V6 / BB 1900 480-V7 BB 1900 480-V8 / BB 1900 480-V9 AB 1900 480-V9
UPS MODELS	up to 60 kVA	up to 80 kVA	up to 120 kVA
Dimensions (mm)			

DETAILS




MST / MSM 10 ÷ 20 (back)
SLOT FOR MULTICOM 382/392 BOARD
ENERGYSHARE SOCKETS
MST 30 ÷ 40 (back)
SLOT FOR MULTICOM 382/392 BOARD
ENERGYSHARE SOCKETS
MST 60 ÷ 100 (back)
SLOT FOR MULTICOM 382/392 BOARD
ENERGYSHARE SOCKETS

OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 372
MULTICOM 382
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
56K Modem
GSM Modem
MBB 100 A

PRODUCT ACCESSORIES
Battery temperature sensor
Powerful battery charger
Programmable relay board MULTICOM 392
UPS with internal isolation transformers (10-40 kVA)
UPS 220 V IN/OUT
IP rating IP31/IP42
Socle Box for MST 60-100
Energyshare sockets

MODELS	MCM/MSM 10 BAT	MCM/MSM 12 BAT	MCM/MSM 15 BAT	MCM/MSM 20 BAT
INPUT				
Nominal voltage	380-400-415 Vac three-phase + N / 220-230-240 Vac single-phase + N			
Nominal frequency	50/60 Hz			
Frequency tolerance	40 - 72 Hz			
Power factor at full load	0.99			
Current distortion	THDI ≤ 3%			
BYPASS				
Nominal voltage	220-230-240 Vac single-phase + N			
Number of phases	1			
Voltage tolerance	180 - 264 V (selectable)			
Nominal frequency	50 or 60 Hz (selectable)			
Frequency tolerance	±5 (selectable)			
OUTPUT				
Nominal power (kVA)	10	12	15	20
Active power (kW)	9	10.8	13.5	18
Power factor	0.9			
Number of phases	1			
Nominal voltage (V)	220-230-240 Vac single-phase + N (selectable)			
Static variation	± 1%			
Dynamic variation	± 3%			
Crest factor	3 : 1 Ipeak/Irms			
Voltage distortion	≤ 1% with linear load / ≤ 3% with non-linear load			
Frequency	50/60 Hz			
Frequency stability during battery operation	0.01%			
Overload at Pf 0.8	115% unlimited, 125% for 10 minutes, 150% for 1 minute, 168% for 5 seconds			
BATTERIES				
Type	VRLA AGM/GEL/NiCd/Li-ion/Supercaps			
Recharge time	6 hours			
INFO FOR INSTALLATION				
Weight without batteries (kg) (MCM/MSM)	80/105	82/110	90/115	95/120
Dimensions (WxDxH) (mm)	320 x 840 x 930 (MCM version) / 440 x 850 x 1320 (MSM version)			
Communications	3 slots for communications interface / USB / RS232			
Operating temperature	0 °C / +40 °C			
Relative humidity	90% non-condensing			
Colour	Dark grey RAL 7016			
Noise level at 1 m	< 52 dBA			
IP rating	IP20			
Smart Active efficiency	up to 98%			
Standards	European Directives: L V 2006/95/CE low voltage Directive EMC 2004/108/CE electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification in accordance with IEC 62040-3 (Voltage Frequency Independent) VFI - SS - 111			
Moving the UPS	castors			

BAT *Also available with internal batteries*

MODELS	MCT/MST 10 BAT	MCT/MST 12 BAT	MCT/MST 15 BAT	MCT/MST 20 BAT	MST 30 BAT	MST 40 BAT	MST 60	MST 80	MST 100	MST 120
INPUT										
Nominal voltage	380-400-415 Vac three-phase + N									
Nominal frequency	50/60 Hz									
Frequency tolerance	40 - 72 Hz									
Power factor at full load	0.99									
Current distortion	THDI ≤ 3%									
BYPASS										
Nominal voltage	380-400-415 Vac three-phase + N									
Number of phases	3 + N									
Voltage tolerance	180 - 264 V (selectable)									
Nominal frequency	50 or 60 Hz (selectable)									
Frequency tolerance	±5 (selectable)									
OUTPUT										
Nominal power (kVA)	10	12	15	20	30	40	60	80	100	120
Active power (kW)	9	10.8	13.5	18	27	36	54	72	90	108
Power factor	0.9									
Number of phases	3 + N									
Nominal voltage	380-400-415 Vac three-phase + N (selectable)									
Static variation	± 1%									
Dynamic variation	± 3%									
Crest factor	3 : 1 Ipeak/Irms									
Voltage distortion	≤ 1% with linear load / ≤ 3% with non-linear load									
Frequency	50/60 Hz									
Frequency stability during battery operation	0.01%									
Overload at Pf 0.8	115% unlimited, 125% for 10 minutes, 150% for 1 minute, 168% for 5 seconds									
BATTERIES										
Type	VRLA AGM/GEL/NiCd/Li-ion/Supercaps									
Recharge time	6 hours									
INFO FOR INSTALLATION										
Weight without batteries (kg) (MCT/MST)	80/105	82/110	90/115	95/120	135	145	190	200	220	380
Dimensions (WxDxH) (mm)	320 x 840 x 930 (MCT version) 440 x 850 x 1320 (MST version)				440 x 850 x 1320		500 x 850 x 1600			750 x 855 x 1900
Communications	3 slots for communications interface / USB / RS232									
Operating temperature	0 °C / +40 °C									
Relative humidity	90% non-condensing									
Colour	Dark grey RAL 7016									
Noise level at 1 m	< 52 dBA				< 48 dBA		< 56 dBA		< 58 dBA	< 70 dBA
IP rating	IP20									
Smart Active efficiency	up to 99%									
Standards	European Directives: L V 2006/95/CE low voltage Directive EMC 2004/108/CE electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification in accordance with IEC 62040-3 (Voltage Frequency Independent) VFI - SS - 111									
Moving the UPS	castors (10 - 100 kVA) / transpallet (120 kVA)									

BAT *Also available with internal batteries*

DATACENTER E-MEDICAL

VFI TYPE
ONLINE

Multi Guard

3:3 1-8 x 15 kVA

Service
1st start

HIGHLIGHTS

- **Power flexibility 15-120 kVA**
- **UPS module with hot-swap function**
- **Modular power and runtime**
- **Intelligent battery charging system**
- **High MTBF and low MTTR**

The Multi Guard modular UPS is a scalable three-phase / three-phase uninterruptible power supply system with double conversion technology. Its power capacity ranges from 15kVA to 120kVA, delivering the best combination of reliability, functionality and flexibility.
The Multi Guard N+X parallel architecture adopts a highly intelligent modular design to achieve maximum power availability and redundancy.
It is specially designed to meet the protection demands of mission critical loads in data centres or other important applications.
Each module has an individual power capacity of 15 kVA, and a standard cabinet can be fitted with up to 8 modules to reach 120 kVA. If the load is within permitted limits, modules can be hot-swapped to enable true power continuity without any interruptions.

System features

- Maximum 120kVA capacity in a 19" rack.
- Input power factor >0.99

THDi <2% and output voltage distortion equal to 1.5%.
- 15 kVA per module with hot-swap function.
- The LCD display on the front panel displays unit status and important information such as input and output nominal values, capacity, temperature and autonomy.
- Communication port for standard Ethernet and relay contact board.
- DSP technology, IGBT input.
- 36 Ampere battery charge current on a 120 kVA system.

Further advantages

- The Multi Guard UPS power modules use the latest DSP microchip technology. This reduces hardware components, increases UPS reliability and also makes it easier to update and maintain the software.
- The UPS operates with load sharing technology. Should any of the UPS modules fail, the load will be taken over by the rest of the modules without interruption. This increases the real time operation and power availability compared to other standby UPS.
- The Multi Guard UPS is designed to connect to external battery banks in order to ensure the required battery run time.

Advanced Modular Design

The Multi Guard system contains UPS modules, a LCD Display module, the PDU and other accessories. Each UPS module is a fully independent 15kVA UPS. Thanks to the advanced wireless parallel control technology and smart communication, the UPS modules and LCD display modules can be easily replaced at any time without affecting UPS operation. The user friendly "plug & play" design simplifies UPS servicing and maintenance.
The Multi Guard de-centralises the control units in each UPS Module. The LCD Display module is for display and communication purposes only. If the LCD Display module fails, the UPS system still functions and supports the load without any interruption.

High capacity MTBF

System MTBF for two modules in parallel is more than 1,000,000 hours and power availability is above 99.999%.
Each 15-120 kVA redundant configuration guarantees correct operation even in the event of the failure of one of the UPS modules. The module replacement procedure only takes 5 minutes for full system recovery.
This solution allows you to:

- Minimise downtime;
- Reduce the number of stored spare parts;
- Avoid the need for specialised technicians

Intelligent recharging system

The Multi Guard UPS system applies a two-step intelligent charging system. The first stage is a constant charging current that can recharge the battery capacity to 90% very quickly. The system then transfers to a constant voltage mode to guarantee the battery can stay fully charged all the time. This intelligent charging system not only reduces the battery recharging time but also extends battery life, saving on battery replacement costs.

Modular Autonomy

The Multi Guard 30 and 60 versions are designed to build up internal run time using a single battery module for all power and autonomy requirements.
The same battery module is also used to build up the required autonomy in an external cabinet.

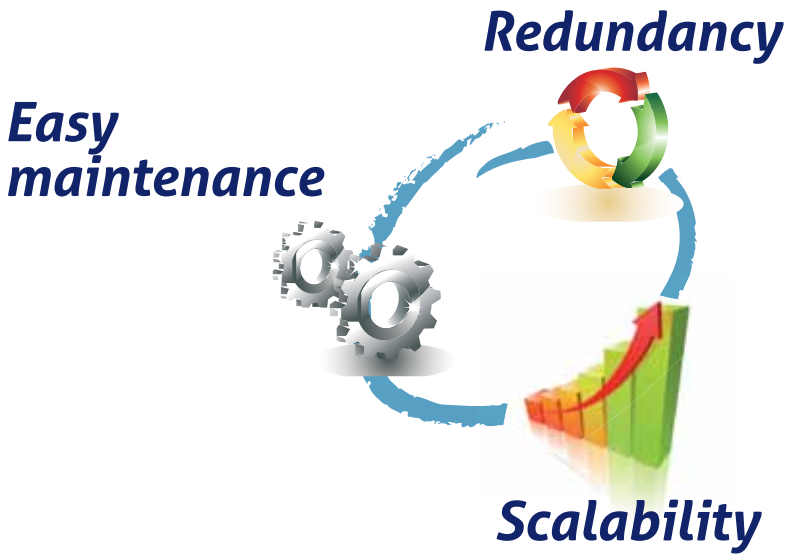
Low total Cost of Ownership (TCO):

– Lower system set-up costs
– Lower energy costs
– Lower cooling costs
– Lower expansion costs
– Lower maintenance costs.

UPS power selection

The Multi Guard can be configured from 1 up to 8 modules in its cabinet to form the most suitable N + X configuration for the application.
Multi Guard grows as your needs grow by simply adding further UPS modules and battery modules to the existing frame. The initial investment is recuperated in cost savings. New power supply requirements can be satisfied without complex and costly replacement operations.

GMT 60 kVA



OPTIONS

PRODUCT ACCESSORIES
Modular battery cabinet (9 shelves, 36 battery modules)
Relay alarm board
Battery cabinets for any autonomy requirements

MULTI GUARD 30

Multi Guard 30 is the entry level to the range. It is the ideal solution for supplying medium-power loads that require one level of redundancy.
The solution is very compact and allows the possibility to expand autonomy up to one and a half hours for a 15 kVA model in a N+1 configuration.
The power rating ranges from 15 kVA to 30 kVA with 1 or 2 UPS modules in a 19'' rack cabinet, which is able to house up to 4 battery shelves.

No. OF POWER MODULES	kVA	Typical autonomy (min)(*)
1	15	90
2	30	42

(*) The autonomy refers to the max. number of installed batteries inside the UPS

MULTI GUARD 60

The Multi Guard 60 system allows you to install from one to four UPS modules (15 kVA to 60 kVA) in a 19" rack cabinet, which is able to house up to 5 battery shelves.
If redundancy is required (N+1 modules) the max. output power will be 45 kVA.

No. OF POWER MODULES	kVA	Typical autonomy (min)(*)
1	15	113
2	30	54
3	45	30
4	60	21

(*) The autonomy refers to the max. number of installed batteries inside the UPS

MULTI GUARD 120

The Multi Guard 120 system allows you to install from one to eight UPS modules (15 kVA to 120 kVA) in a 19" rack cabinet, with batteries housed in an external cabinet. This cabinet houses the same battery modules as those used for the GMT 30/60 versions, up to a maximum of 9 battery shelves.

No. OF POWER MODULES	kVA	Typical autonomy (min)(*)
1	15	217
2	30	103
3	45	65
4	60	49
5	75	36
6	90	30
7	105	22
8	120	10

(*) The autonomy refers to the max. number of installed batteries inside the modular battery cabinet (9 shelves).

MODEL	GMT - from 15 kVA to 120 kVA
INPUT	
Voltage	380-400-415 Vac, three-phase + N
Voltage tolerance	from 294 Vac to 520 Vac
Frequency tolerance	between 40 Hz and 70 Hz
Power factor	>0.99
THDI	< 2%
BYPASS	
Voltage	380-400-415 Vac, three-phase + N
Voltage tolerance	from 323 Vac to 437 Vac
Transfer time from on-line to off-line or vice versa	0 sec
OUTPUT	
Voltage	380-400-415 Vac, three-phase + N (selectable)
Voltage stability	≤ 1.5%
Frequency	50 Hz / 60 Hz
UPS MODULE	
Power	15 kVA / 13.5 kW
Output power	15 kVA x number of modules, up to a maximum of 8
SPECIFICATIONS	
Noise level at 1 m	from ≤ 60 dBA to ≤ 62 dBA
Operating temperature	0 °C / +40 °C
Humidity	20% - 90% non-condensing
Storage temperature	-15 °C +55 °C
UPS module weight (kg)	35
UPS module dimensions (WxDxH) (mm)	440 x 700 x 131
GMT 30 cabinet dimensions (WxDxH) (mm)	600 x 1000 x 1500
GMT 60 cabinet dimensions (WxDxH) (mm)	600 x 1000 x 2000
GMT 120 cabinet dimensions (WxDxH) (mm)	600 x 1000 x 2000
Modular battery cabinet dimensions (WxDxH) (mm)	9 battery shelves, 36 battery modules 597x1003x2000
Eco Mode efficiency	up to 99%
Standards	Safety: IEC 62040-1 EMC: IEC 62040-2
Moving the UPS	transpallet

DATACENTER E-MEDICAL INDUSTRY TRANSPORT

VFI TYPE ONLINE

Multi Guard Industrial

1-3:1 1-8 x 20 kVA

1-3:3 1-8 x 20 kVA

6 ECO LEVEL

USB **USB** plug

SmartGrid ready

service **Service** 1st start

HIGHLIGHTS

- **High adaptability to input voltage**
- **Zero impact source**
- **Compatible with industrial environments**
- **Modular Plug & Play solution**
- **Complete flexibility**

The Multi Guard Industrial range was specially developed to ensure power continuity in all sectors deemed critical due to the specific environmental conditions or industrial processes requiring protection. Multi Guard Industrial is available in a 20 kVA stand alone version and in modular versions from 20 to 160 kVA. The two versions are available in both single-phase and three-phase output configurations. This high level of flexibility allows Multi Guard Industrial to accept both single-phase and three-phase inputs with no need for special set ups or operator intervention, ensuring full compatibility with any power supply network.

High adaptability to input voltage

Multi Guard Industrial is available in two versions: single-phase and three-phase output, whilst the input stage accepts both a triplet of three-phase supplies out-of-phase by 120° (three-phase 400 V+N) or a triplet of power supplies in phase (single-phase 230 V+N). Thanks to its power supply recognition function the UPS is able to adapt to the input power supply with no need for additional configuration, ensuring the same performance under both applied voltage conditions.

Zero impact source

Thanks to the technology it employs,

Parallel configuration and programmable relay contacts board

Harting connectors

Multi Guard Industrial solves all problems connected with insertion into power supply grids with limited power, where the UPS is supplied by a generator and where the same network includes single-phase (e.g. railway voltage) and three-phase (e.g. emergency power supply from a generator) supplies.
Multi Guard Industrial has zero impact on the power supply source, whether it is a mains grid or generator set, single-phase or three-phase:

- power supply voltage recognition (single/three-phase), with no need for setting up or reconfiguring parameters
- input current distortion < 3%
- input power factor 0.99
- power walk-in function that ensures progressive rectifier start up
- start-up delay function, to restart the rectifiers when mains power is restored if there are several UPS in the system.
- 'cold start' function for starting the UPS from the battery.

In addition, Multi Guard Industrial plays a filtering and power factor correction role in the power network upstream of the UPS as it eliminates harmonic components and reactive power generated by utility suppliers.

Compatible with industrial environments

The mechanical structure of Multi Guard Industrial makes it particularly versatile for use in many different sectors.
The basic building blocks are 20 kVA UPS.
The cabinet is able to house up to four 20 kVA modules and up to two cabinets can be connected in parallel for a total of eight UPS modules and 160 kVA of power.
The module connection clamps are laid out so that the communication signal connections are segregated and separated from the power connections (input, output, bypass line, battery), thus ensuring complete immunity from interference generated by the power supply grid, which is typically disturbed in industrial environments.
Both versions (single-phase and three-phase output) are provided with a bypass line separated from the power supply line. This ensures greater availability in that the customer may have a preferential line for the bypass that is not restricted by the potential interference or interruptions that the UPS power supply line may be subject to.
The UPS module has a front to back air flow, allowing the UPS to be installed in any environment and preventing the types of ingress problems associated with top-vented circulations cabinets.
Every UPS module in the Multi Guard Industrial range can be equipped with a parallel board, a relay board with eight programmable outputs and three inputs (one of which is programmable), and two slots for housing communications interface boards from the MultiCOM range, making the UPS compatible with the various types of protocols and supervision systems typical of the industrial environment.
The cabinet is designed to house up to four UPS modules. I t has an area that contains all the protection devices and disconnectors for the individual modules (4 input disconnectors, 4 battery disconnectors, 4 bypass line disconnectors and 4 output disconnectors), as well as a manual bypass for isolating the four modules and guaranteeing power continuity in the event of the complete failure of all the UPS units or in the event of scheduled system overhaul.
The cabinet is also equipped with an area that can be used for the insertion of a whole range of accessories for monitoring power that the user can request (surge arresters, energy meters, earth discharge detectors, output distribution, release coils, etc), making the solution compact and optimised for any field of use.

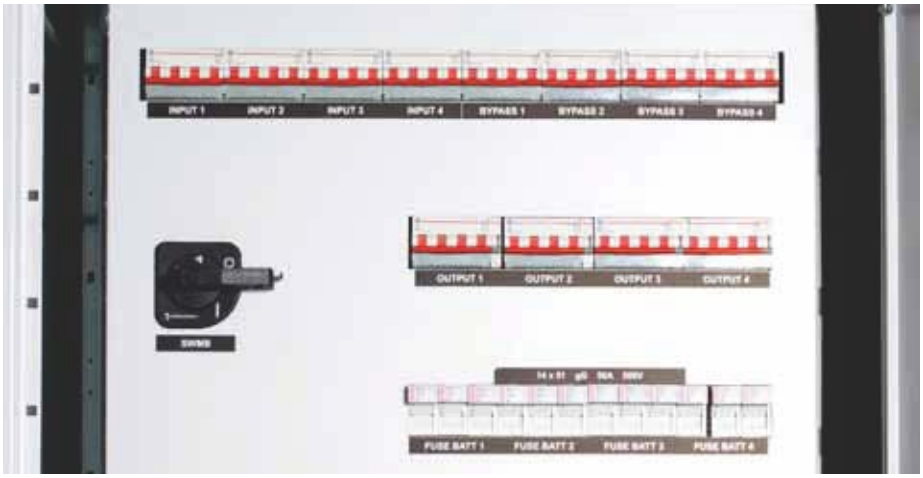
Modular Plug & Play solution

Multi Guard Industrial can be purchased as a single 20 kVA UPS module and installed in any cabinet or mechanical support provided by the user. The power terminals (input, output, battery) are connected by Harting connectors, ensuring simplicity and operating safety during insertion/removal, protection against electrical contacts and immunity from environmental conditions typical of industrial environments (dust, humidity, suspended chemical particles).
The removal and replacement of a faulty module or the addition into the system of a further UPS module to increase available power or redundancy can be carried out easily by the operator responsible for the system.

Complete flexibility

Multi Guard Industrial is the ideal solution for industrial environments in which the UPS must adapt to the various requirements typical of this application. Aside from the distinction between single-phase and three-phase output voltages, the UPS module can be used as a stand-alone unit or in a parallel configuration; by simply adding the parallel configuration board in the slot on the front of the module, the UPS can grow as requirements demand (from 20 to 160 kVA).
Multiguard Industrial ensures horizontal

scalability that minimises the system footprint, the user can thus have power capabilities from 20 to 80 kVA without increasing the footprint. This is particularly advantageous when the system is installed in environments with space limitations (e.g. containers, historic buildings, sites spread out over a territory).
Each UPS is equipped with a graphic display, a programmable relay board slot and two slots for communications interfaces, all situated at the front for quick and organised installation.
Every UPS module in the Multi Guard Industrial range is completely independent with regards to the control and management of the operator interfaces; this facilitates all monitoring, control and fault-detection operations, ensuring increased reliability in that any malfunctions in parts or accessory will not propagate through the entire system. Multi Guard Industrial is a UPS that uses many components also used in the Multi Sentry range; in particular the display and navigation menus are the same: this allows for rapid and intuitive access to information as well as simplified management of the spare parts in storage.



Detail of protective devices and disconnectors

Stand-alone version:

Different from the cabinet version, the stand alone system is supplied with input, bypass line, output and battery connectors with loose cables three metres in length and filter boards that the installation technician must position inside the destination cabinet or near the module.

OPTIONS

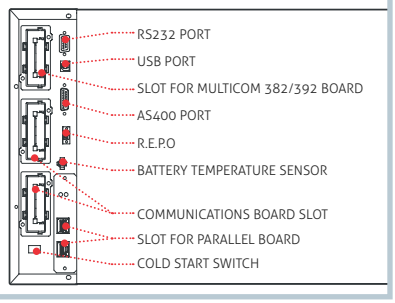
SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 382
MULTICOM 401
MULTI I/O
MULTIPANEL
RTG 100

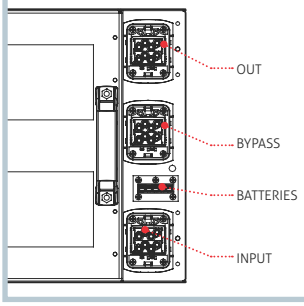
PRODUCT ACCESSORIES
Battery temperature sensor
Powerful battery charger
Programmable relay board MULTICOM 392
IP rating IP31/IP42
Internal batteries
MST range battery cabinets

DETAILS

Right front panel (UPS MODULE)



Left front panel (UPS MODULE)



MODEL	GMI single-phase output (GMI M) from 20 kVA to 160 kVA	GMI three-phase output (GMI T) from 20 kVA to 160 kVA
INPUT		
Voltage	380-400-415 Vac, three-phase + N and 220-230-240 Vac single-phase + N (input voltage recognition function)	
Voltage tolerance	-40/+20% *	
Frequency tolerance	between 40 Hz and 72 Hz	
Power factor	>0.99	
THDI	< 3%	
BYPASS		
Voltage	220-230-240 Vac, single-phase + N	380-400-415 Vac, three-phase + N
Voltage tolerance	180 - 264 V (selectable) referring to neutral phase	
OUTPUT		
Voltage	220-230-240 Vac, single-phase + N (selectable)	380-400-415 Vac, three-phase + N (selectable)
Voltage stability	≤ 1%	
Frequency	50 Hz / 60 Hz	
UPS MODULE		
Power	20 kVA / 18 kW	
Output power	20 kVA x number of modules, up to a maximum of 8 (max. 160 kVA)	
BATTERIES		
Layout	independent batteries for each UPS module or shared by the UPS system	
Type	VRLA AGM/GEL	
Recharge time	6 hours	
SPECIFICATIONS		
Noise level at 1 m	from ≤ 52 dBA to ≤ 70 dBA	
Operating temperature	O °C / +40 °C	
Humidity	20% - 90% non-condensing	
Storage temperature	-15° +55°	
UPS module weight (kg)	64	
UPS module dimensions (WxDxH) (mm)	620 x 745 x 320	
GMI cabinet weight 80 (kg)	200 (UPS modules excluded)	
GMT 80 cabinet dimensions (WxDxH) (mm)	850 x 850 x 2060	
Modular battery cabinet dimensions (WxDxH) (mm)	9 battery shelves, 36 battery modules 597 x 1003 x 2000	
Eco Mode efficiency	up to 99%	
Standards	Safety: IEC 62040-1 EMC: IEC 62040-2	
Moving the UPS	transpallet (UPS cabinet) - 2 operators (UPS module)	

* *conditions applied*

NOTE : The GMI UPS is also compatible with the battery cabinets in the Multi Sentry range (MST)

DATACENTER E-MEDICAL INDUSTRY TRANSPORT EMERGENCY

VFI TYPE ONLINE

Master MPS

3:1 10-100 kVA

3:3 10-800 kVA

ECO LEVEL 4

SmartGrid ready

Flywheel compatible

Supercaps UPS

Service 1st start

HIGHLIGHTS

- **Efficiency Control System (ECS)**
- **Robust and reliable**
- **Galvanic isolation**
- **High overload capacity**
- **Extensive parallel configurations**

Total protection

Master MPS series UPS provide maximum protection and power quality for mission critical loads, including data centres, industrial processes, telecommunications, security and electro-medical systems. Master MPS is an on-line double conversion UPS (VFI SS 111 - IEC EN 62040-3) with a transformer isolated inverter.

The Master MPS range includes three-phase input and single-phase output versions from 10 to 100 kVA, and three-phase input and output versions from 10 to 800 kVA.

All versions are provided with a 6-pulse thyristor-based rectifier, with or without optional harmonic filters.

A 12-pulse thyristor-based rectifier is available on request for the 60 and 80 kVA versions (provided as standard for MPT 800), with or without optional harmonic filters.

Easy source

Master MPS makes supplying the UPS from generator sets and MT/BT transformers

simpler and more efficient, reducing power loss in the system and coils, correcting the power factor and eliminating current harmonics created by the loads supplied by the UPS.
In addition to this, the progressive rectifier start-up (power walk-in) and the option to reduce battery charging currents, allow for a reduction in the input current uptake. This means less demand on the source, which is particularly useful when the source is a generator set.

Power continuity

For years, Riello UPS has developed and supplied solutions for dealing with the different requirements and the problems that inevitably arise in critical applications. Riello UPS offers flexible, high-availability, solutions that are able to adapt to different system structures and critical levels.
Riello UPS creates UPS systems that can tolerate a number of component or subsystem failures, while continuing to operate normally, providing power without interruption.
This is achieved by careful design, installing redundant elements, eliminating common failure points, scheduling maintenance activities and controlling and supervising the system operating parameters and environment. The TEC service team is ready to provide guidance and advice on projects.

Flexibility

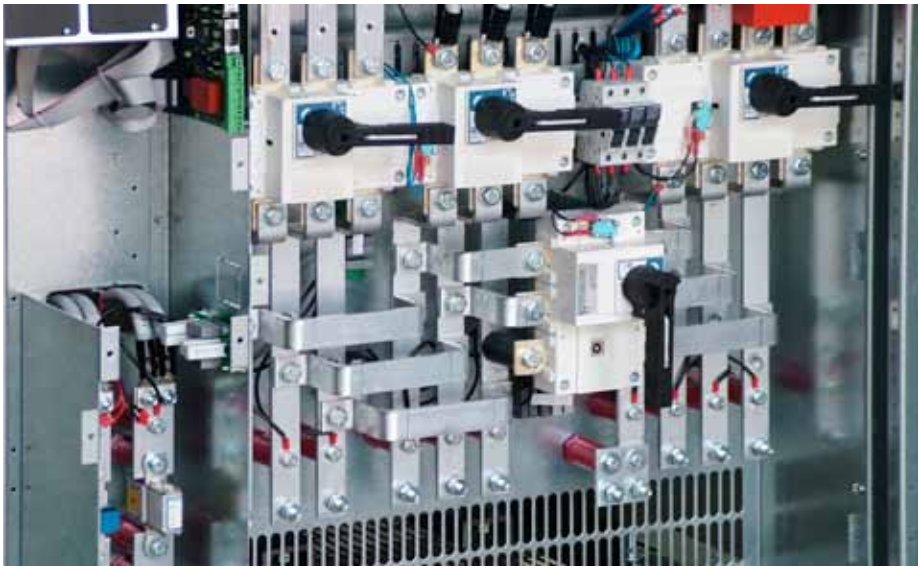
Master MPS is suitable for a wide range of applications including IT and the most demanding industrial environments. The UPS is suitable for power capacitive loads such as blade servers, without any reduction in active power, from 0.9 leading to 0.8 lagging.
With a broad range of accessories and options, complex configurations and system architectures can be achieved to guarantee maximum power availability and the option to add new UPS without interruption to existing users.
Using the Riello UPS Group Synchroniser (UGS) and Parallel Systems Joiner (PSJ), sophisticated inter group parallel and redundant systems can be achieved to provide the highest possible levels of resilience and availability.

Battery care system: maximum battery care

Normally the batteries are kept charged by the rectifier; when mains power fails, the UPS uses this energy source to power the consumers. Proper battery care is therefore critical to ensuring correct UPS operation under emergency conditions. The Riello UPS battery care system consists of a series of functions designed to optimise battery management and achieve the best performance and operating life possible:

- Dual level charging regime to optimise recharge currents and reduce charge times
- Temperature compensation and deep discharge protection to reduce battery ageing and improve battery life
- Charge blocking system to reduce electrolyte consumption and lengthen the life of VRLA batteries
- Battery tests to diagnose, in advance, any reduction in performance or problems with the batteries.

Master MPS is also compatible with different battery technologies: vented open lead acid, VRLA AGM, Gel, NiCd, Flywheels, Supercaps and Lithium.



Detail of connection area

Easy installation

Master MPS requires a very small space for installation (only 0.64 m^2 for a 200kVA system); in addition, front access allows for the servicing of all major components from the front panel, making side access unnecessary. In addition, front access allows servicing of all major components from the front panel, making side access unnecessary. Master MPS requires minimal space for access, utilising top-cabinet ventilation and front panel access.

Specific solutions

The UPS can be adapted to meet the most specific requirements. Contact our TEC team to discuss specific solutions and options not listed in this catalogue.

Advanced communications

- Compatible with TeleNetGuard for remote monitoring.
- Advanced multi-platform communications for all operating systems and network environments: PowerShield³ monitoring and shutdown software included, with SNMP agent, for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X, Sun Solaris, Linux, Novell and other Unix operating systems
- The UPS is provided with a cable for direct connection to a PC (Plug and Play)
- Double RS232 serial port
- Communications slot for network adapter installation; ESD contact (Emergency Switching Device) for switching off the UPS by remote emergency button
- Remote display panel with graphic display.

Maximum reliability and availability

- Distributed or centralised parallel configuration of up to 8 units per redundant (N+1) or power parallel system. Parallel configurations using models with different power ratings are also possible.
- Hot System Expansion (HSE): allows the addition of a further UPS into an existing system, without the need to switch off the existing UPS or transfer them to bypass mode. This guarantees maximum load protection, even during maintenance and system expansion.
- Maximum levels of availability, even in the event of an interruption to the parallel bus cable: the system is "FAULT TOLERANT". It is not affected by connection cable faults and continues powering the load without disruption, signalling an alarm condition.
- Efficiency Control System (ECS): a system to optimise the operating efficiency of parallel systems, according to the power

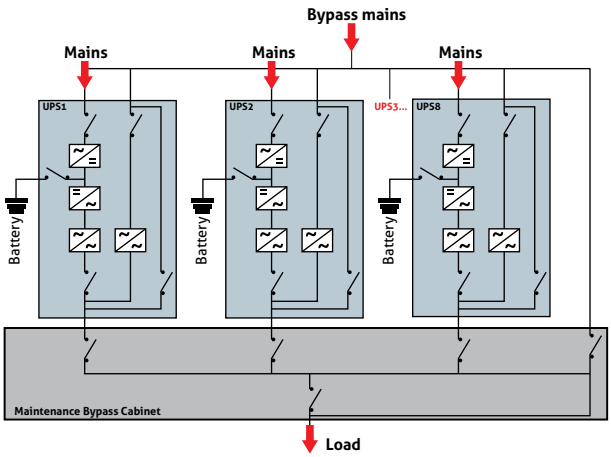
required by the load. N +1 redundancy is guaranteed, with every UPS working in parallel at the best load level possible to achieve higher overall efficiency.

Options

- ***UPS Group Synchroniser (UGS)***
  Allows two or more non-parallel UPS devices to remain synchronised even during mains power failure.
  The UGS also enables a Riello UPS to be synchronised with another power source that is independent and of a different power rating.
- ***Parallel Systems Joiner (PSJ)***
  Allows two groups of UPS to be connected in parallel whilst operating, in the event of maintenance (with no interruption to the output), using a power coupling switch. Should one of the UPS in one of the parallel groups fail, it is automatically excluded.
  The PSJ connects the remaining UPS, to the other parallel group via an external bypass, in order to continue to guarantee load redundancy.

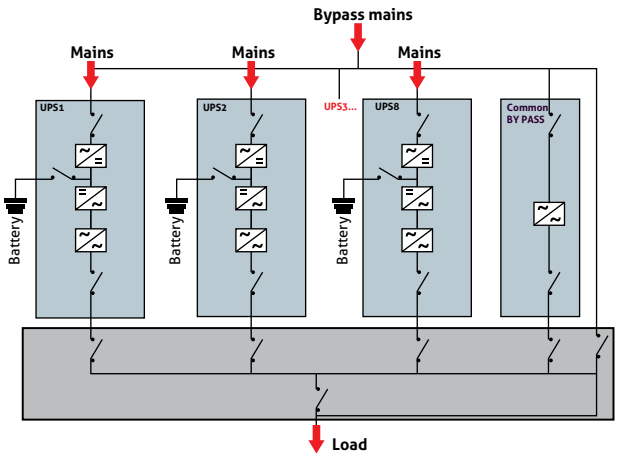
PARALLEL CONFIGURATION OF UP TO 8 UPS UNITS WITH DISTRIBUTED BYPASS

Parallel architecture to ensure redundancy of the power source.
+ Flexibility and modularity and no single point of failure.



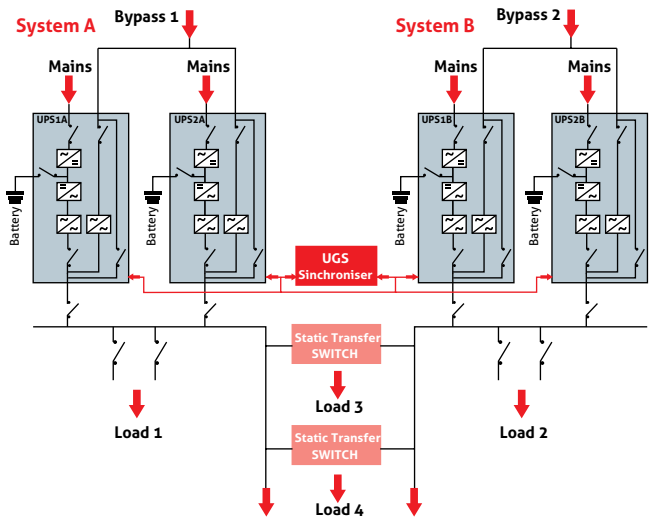
PARALLEL CONFIGURATION OF UP TO 8 UPS UNITS WITH COMMON BYPASS

Parallel architecture to ensure redundancy of the power source, with autonomous bypass management.
+ Selectivity of downstream faults in bypass mode



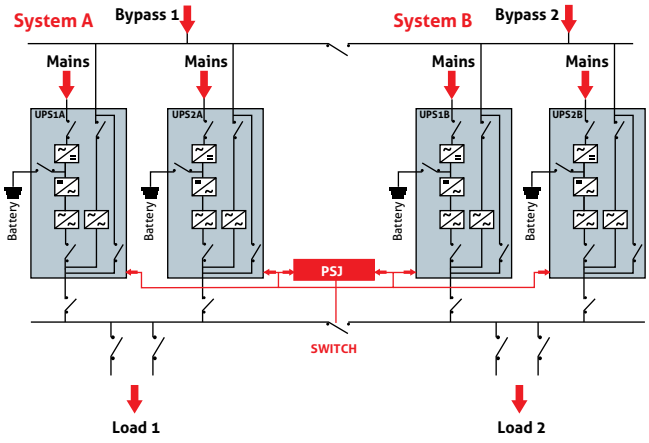
DYNAMIC DUAL BUS CONFIGURATION

Solution to ensure redundancy up to the distribution of the power supply to the loads and improved STS operation.
+ Downstream fault discrimination

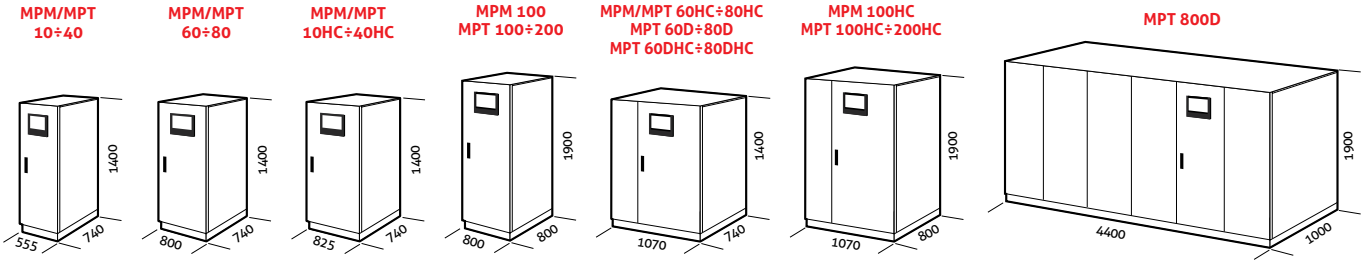


DUAL BUS SYSTEM CONFIGURATION

Solution to ensure redundancy of the power supply even during maintenance. **+ High availability and redundancy**



DIMENSIONS



HC= Version with filtering of 5th or 11th harmonics D= Twelve-phase version

OPTIONS

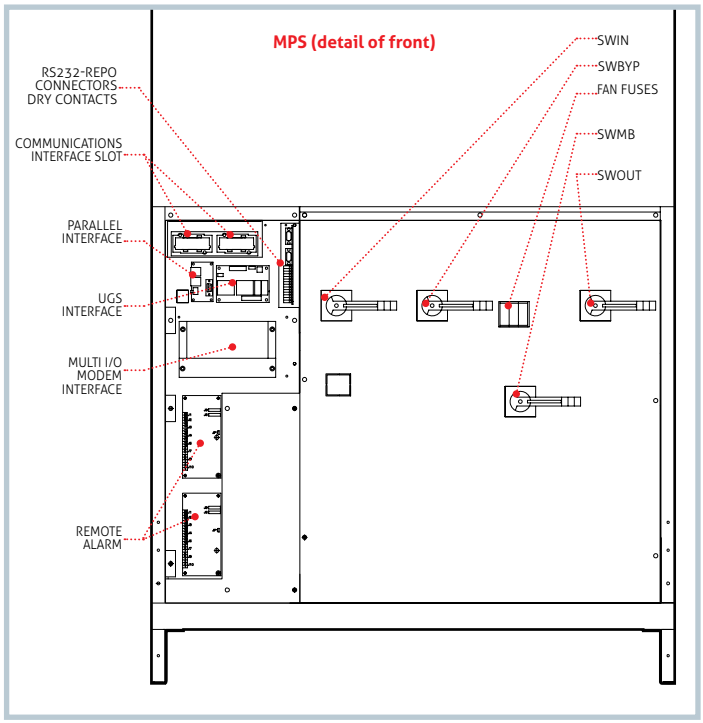
SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
56K Modem
GSM Modem
MBB 100 A

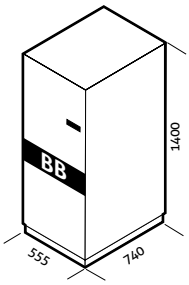
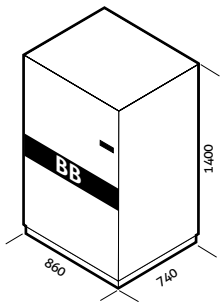
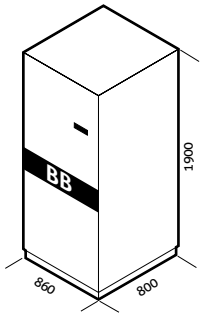
PRODUCT ACCESSORIES
Twelve-phase version (D)
Filtering of 5th and 11th harmonics (HC)
Isolation transformer
Synchronisation device (UGS)
Hot connection device (PSJ)
Generator interface
Parallel configuration kit (Closed Loop)
Battery cabinets empty or for extended runtimes
Top Cable Entry cabinets
IP rating IP31/IP42

DETAILS

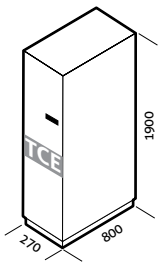
MPT 200 open



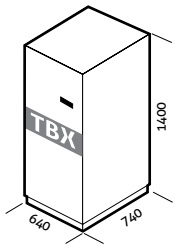
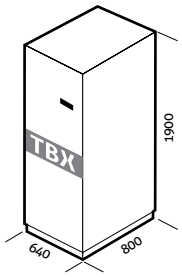
BATTERY BOX

MODELS	BB 1400 384-B1	BB 1400 384-B2 / BB 1400 384-B3 BB 1400 384-B4	BB 1900 396-L6 / BB 1900 396-L7 BB 1900 396-L8 / BB 1900 396-L9	BB 1900 480-V6 / BB 1900 480-V7 BB 1900 480-V8 / BB 1900 480-V9
UPS MODELS	MPT 10-60	MPT 10-80	MPT 100-200 / MPM 100	MPT 800
Dimensions (mm)				

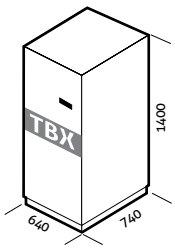
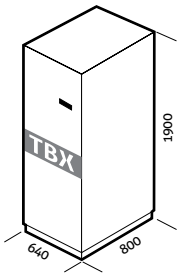
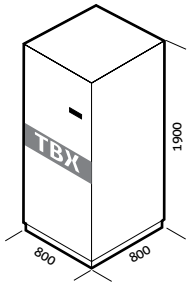
CABINETS WITH TOP ACCESS FOR CABLES

MODELS	TCE MPT 100-200
UPS MODELS	MPT 100-200 / MPM 100
Dimensions (mm)	

SINGLE-PHASE ISOLATION TRANSFORMERS

MODELS	TBX 10 M - TBX 80 M	TBX 100 M
UPS MODELS	MPM 10-80	MPM 100
Dimensions (mm)		

THREE-PHASE ISOLATION TRANSFORMERS

MODELS	TBX 10 T - TBX 80 T	TBX 100 T - TBX 160 T	TBX 200 T - TBX 250 T
UPS MODELS	MPT 10-80	MPT 100-160	MPT 200
Dimensions (mm)			

MODELS	MPM 10 BAT	MPM 15 BAT	MPM 20 BAT	MPM 30	MPM 40	MPM 60	MPM 80	MPM 100
INPUT								
Nominal voltage	380 - 400 - 415 Vac three-phase							
Voltage tolerance	400 V + 20% /- 25%							
Frequency	45 - 65 Hz							
Soft start	0 - 100% in 120'' (selectable)							
Permitted frequency tolerance	± 2% (selectable from ± 1% to ± 5% from front panel)							
Standard equipment provided	Back Feed protection; separable bypass line							
BYPASS								
Nominal voltage	360-400-420 Vac three-phase + N							
Nominal frequency	50 or 60 Hz (selectable)							
OUTPUT								
Nominal power (kVA)	10	15	20	30	40	60	80	100
Active power (kW)	9	13,5	18	27	36	54	72	90
Number of phases	1							
Nominal voltage	220 - 230 - 240 Vac single-phase + N (selectable)							
Static stability	± 1%							
Dynamic stability	± 5% in 10 ms							
Voltage distortion	< 1% with linear load / < 3% with non-linear load							
Crest factor	3:1 lpeack/lrms							
Frequency stability on battery	0.05%							
Frequency	50 or 60 Hz (selectable)							
Overload	110% for 60'; 125% for 10'; 150% for 1'							
BATTERIES								
Type	VRLA AGM / GEL; NiCd; Supercaps; Li-ion; Flywheels							
Residual ripple voltage	< 1%							
Temperature compensation	-0.5 Vx°C							
Typical charge current	0.2 x C10							
INFO FOR INSTALLATION								
Weight without batteries (kg)	200	220	230	270	302	440	500	580
Dimensions (WxDxH) (mm)	555 x 740 x 1400					800 x 740 x 1400		800 x 800 x 1900
Remote signals	dry contacts							
Remote controls	ESD and bypass							
Communications	Double RS232 + dry contacts + 2 slots for communications interface							
Operating temperature	0 °C/ +40 °C							
Relative humidity	<95% non-condensing							
Colour	Dark grey RAL 7016							
Noise level at 1 m	60 dBA			62 dBA				
IP rating	IP20							
Smart Active efficiency	up to 98%							
Standards	Directives LV 2006/95/EC - 2004/108/EC; Safety IEC EN 62040-1; EMC IEC EN 62040-2; Performance IEC EN 62040-3							
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111							
Moving the UPS	transpallet							

BAT *Also available with internal batteries*

MODELS	MPT 10 [BAT]	MPT 15 [BAT]	MPT 20 [BAT]	MPT 30	MPT 40	MPT 60	MPT 80
INPUT							
Nominal voltage	380 - 400 - 415 Vac three-phase						
Voltage tolerance	400 V + 20% /- 25%						
Frequency	45 - 65 Hz						
Soft start	0 - 100% in 120'' (selectable)						
Permitted frequency tolerance	± 2% (selectable from ± 1% to ± 5% from front panel)						
Standard equipment provided	Back Feed protection; separable bypass line						
BYPASS							
Nominal voltage	360-400-420 Vac three-phase + N						
Nominal frequency	50 or 60 Hz (selectable)						
OUTPUT							
Nominal power (kVA)	10	15	20	30	40	60	80
Active power (kW)	9	13,5	18	27	36	54	72
Number of phases	3 + N						
Nominal voltage	380 - 400 - 415 Vac three-phase + N (selectable)						
Static stability	± 1%						
Dynamic stability	± 5% in 10 ms						
Voltage distortion	< 1% with linear load / < 3% with non-linear load						
Crest factor	3:1 lpeack/lrms						
Frequency stability on battery	0.05%						
Frequency	50 or 60 Hz (selectable)						
Overload	110% for 60'; 125% for 10'; 150% for 1'						
BATTERIES							
Type	VRLA AGM / GEL; NiCd; Supercaps; Li-ion; Flywheels						
Residual ripple voltage	< 1%						
Temperature compensation	-0.5 V/°C						
Typical charge current	0.2 x C10						
INFO FOR INSTALLATION							
Weight without batteries (kg)	228	241	256	315	335	460	540
Dimensions (WxDxH) (mm)	555 x 740 x 1400					800 x 740 x 1400	
Remote signals	dry contacts						
Remote controls	ESD and bypass						
Communications	Double RS232 + dry contacts + 2 slots for communications interface						
Operating temperature	0 °C / +40 °C						
Relative humidity	<95% non-condensing						
Colour	Dark grey RAL 7016						
Noise level at 1 m	60 dBA				62 dBA		
IP rating	IP20						
Smart Active efficiency	up to 98%						
Standards	Directives LV 2006/95/EC - 2004/108/EC; Safety IEC EN 62040-1; EMC IEC EN 62040-2; Performance IEC EN 62040-3						
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111						
Moving the UPS	transpallet						

[BAT] *Also available with internal batteries*

MODELS	MPT 100	MPT 120	MPT 160	MPT 200	MPT 800
INPUT					
Nominal voltage	380 - 400 - 415 Vac three-phase				
Voltage tolerance	400 V + 20% /- 25%				
Frequency	45 - 65 Hz				
Soft start	0 - 100% in 120'' (selectable)				
Permitted frequency tolerance	± 2% (selectable from ± 1% to ± 5% from front panel)				
Standard equipment provided	Back Feed protection; separable bypass line				
BYPASS					
Nominal voltage	360-400-420 Vac three-phase + N				
Nominal frequency	50 or 60 Hz (selectable)				
OUTPUT					
Nominal power (kVA)	100	120	160	200	800
Active power (kW)	90	108	144	180	640
Number of phases	3 + N				
Nominal voltage	380 - 400 - 415 Vac three-phase + N (selectable)				
Static stability	± 1%				
Dynamic stability	± 5% in 10 ms				
Voltage distortion	< 1% with linear load / < 3% with non-linear load				
Crest factor	3:1 lpeack/lrms				
Frequency stability on battery	0.05%				
Frequency	50 or 60 Hz (selectable)				
Overload	110% for 60'; 125% for 10'; 150% for 1'				
BATTERIES					
Type	VRLA AGM / GEL; NiCd; Supercaps; Li-ion; Flywheels				
Residual ripple voltage	< 1%				
Temperature compensation	-0.5 V/°C				
Typical charge current	0.2 x C10				
INFO FOR INSTALLATION					
Weight (kg)	600	610	690	790	5300
Dimensions (WxDxH) (mm)	800 x 800 x 1900				4400 x 1000 x 1900
Remote signals	dry contacts				
Remote controls	ESD and bypass				
Communications	Double RS232 + dry contacts + 2 slots for communications interface				
Operating temperature	0 °C / +40 °C				
Relative humidity	<95% non-condensing				
Colour	Dark grey RAL 7016				
Noise level at 1 m	65 dBA	68 dBA			77 dBA
IP rating	IP20				
Smart Active efficiency	up to 98%				
Standards	Directives LV 2006/95/EC - 2004/108/EC; Safety IEC EN 62040-1; EMC IEC EN 62040-2; Performance IEC EN 62040-3				
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111				
Moving the UPS	transpallet				

DATACENTER E-MEDICAL INDUSTRY TRANSPORT EMERGENCY

VFI TYPE ONLINE

Master HP

3:3 100-600 kVA

6 ECO LEVEL

SmartGrid ready

Flywheel compatible

Supercaps UPS

Service 1st start

HIGHLIGHTS

- High efficiency (up to 98.5%)
- IGBT-based rectifier technology
- Compact and reliable
- Galvanic isolation
- High overload capacity
- LCD Display

The Master HP series from 100 to 600 kVA is the Riello UPS solution for installations requiring high energy efficiency and maximum power availability.
Master HP Series provides maximum protection and power quality for data centres and industrial loads. The UPS has an IGBT-based rectifier, DSP (Digital Signal Processors) technology and provides true On-line, double conversion power protection, (VFI SS 11 - Voltage and Frequency Independent in accordance with IEC EN 62040-3).

Maximised cost savings

The build specifications offered by the Master HP range and the exceptional level of efficiency help to absorb the TCO, from the installation stage to daily operation, reducing power costs for the UPS and air conditioning system and installation area costs thanks to its reduced size and weight.
Thanks to the ability to monitor the mains input quality and to select the best operating mode based on the interference present (Smart Active mode) or circular redundancy (Parallel Energy Saving mode, which allows the UPS to regulate available

capacity based on the immediate demands of the load, automatically switching to standby in the event of excess capacity), the Master HP offers high levels of efficiency also for partial loads, resulting in reduced operating costs.

Power continuity

For years, Riello UPS has developed and supplied solutions for dealing with the different requirements and problems that inevitably arise in critical applications. Riello UPS offers flexible, high-availability solutions that are able to adapt to different system structures and critical levels. Riello UPS creates UPS systems that can tolerate a number of component or subsystem failures, while continuing to operate normally, providing power without interruption. This is achieved by careful design, installing redundant elements, eliminating common failure points, scheduling maintenance activities and controlling and supervising the system operating parameters and environment. The TEC service team is ready to provide guidance and advice on projects.

Complete galvanic isolation

Master HP UPS feature an output isolation transformer (on the inverter), inside the UPS cabinet, providing galvanic isolation of the load towards the battery and improved versatility in system configuration, allowing:

- Complete galvanic isolation for medical applications and critical infrastructures
- two truly separate network inputs (main and emergency), coming from two different power sources (with different neutrals); this is particularly well suited to parallel systems in order to ensure selectivity between the two sources, thus improving the reliability of the entire installation;
- Installation in networks without neutral.

Housing the transformer inside the cabinet allows for a significant reduction in the footprint, providing space savings.

Zero impact source

The Master HP series features the added advantages of the Zero Impact Source formula offered by an IGBT-based rectifier assembly. This eliminates problems connected with installation in networks with limited power capacity, where the UPS is supplied by a generator set or anywhere there are compatibility problems with loads that generate current harmonics. Master HP series UPS have zero impact on the power supply source, whether it is a mains grid or generator set:

- input current distortion < 3%
- input power factor 0.99
- power walk-in function that ensures progressive rectifier start up
- start-up delay function, to restart the rectifiers when mains power is restored if there are several UPS in the system.

This provides savings in installation costs via:

- a smaller electrical infrastructure.
- smaller circuit protection devices
- less wiring.

Master HP also performs the role of a filter and power factor corrector, protecting the upstream power supply from any harmonics and reactive power generated by the consumers.

Flexibility

Master HP is suitable for a wide range of applications including IT and the most demanding industrial environments. The UPS is suitable for power capacitive loads such as blade servers, without any reduction in active power, from 0.9 leading to 0.8 lagging.
With a broad range of accessories and options, complex configurations and system architectures can be achieved to guarantee maximum power availability and the option to add new UPS without interruption to existing users.
Using the Riello UPS Group Synchroniser (UGS) and Parallel Systems Joiner (PSJ), sophisticated inter group parallel and redundant systems can be achieved to provide the highest possible levels of resilience and availability.

Specific solutions

The UPS can be adapted to meet your requirements. Contact our TEC team to discuss specific solutions and options not listed in this catalogue.

Battery care system: maximum battery care

The Master HP range uses the sophisticated Battery Care System, also available on the Master MPS models, which optimises battery performance in order to extend the battery life for as long as possible.

Main features

- High efficiency (up to 98.5%)
- Compact size: e.g.: only 0.85 m² for the Master HP 250 kVA
- Reduced weight
- Double load protection, both electronic and galvanic, towards the battery.

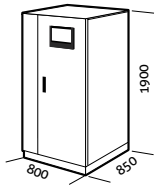
The entire Master HP range is suitable for use in a wide range of applications. Thanks to the flexibility of configuration, available options and accessories, it is suitable for supplying any type of load, e.g. capacitive loads such as blade servers etc.
Power supply reliability and availability are ensured for critical applications by distributed or centralised parallel configurations of up to 8 units, for redundant (N+1) or power parallel configurations and all the different configurations offered by the Master MPS range.

Smart Grid Ready

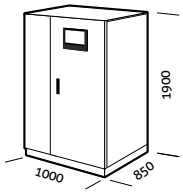
Being smart grid ready, Master HP allows for the implementation of power accumulation solutions, and at the same time ensures extremely high levels of efficiency. It is also able to independently select the most efficient operating method based on the status of the grid. Master HP UPS are also able to electronically interface with the energy manager using the smart grid communication network.

DIMENSIONS

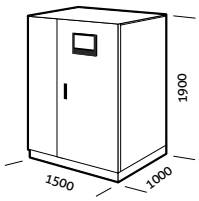
MHT 100
MHT 120



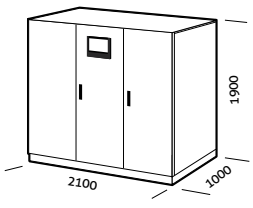
MHT 160 - MHT 200
MHT 250



MHT 300
MHT 400



MHT 500
MHT 600



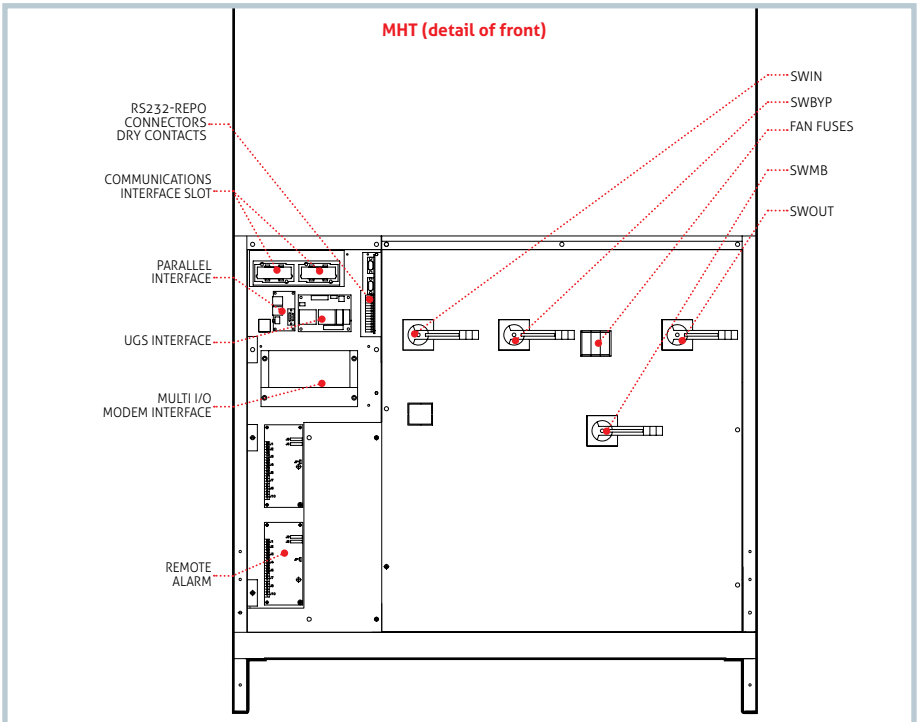
OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
56K Modem
GSM Modem

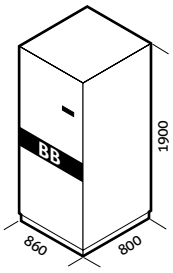
PRODUCT ACCESSORIES
Isolation transformer
Synchronisation device (UGS): *see Master MPS on page 84*
Hot connection device (PSJ): *see Master MPS on page 84*
Generator interface
Parallel configuration kit (Closed Loop)
Battery cabinets empty or for extended runtimes
Top Cable Entry cabinets
IP rating IP31/IP42

DETAILS

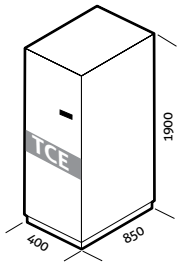
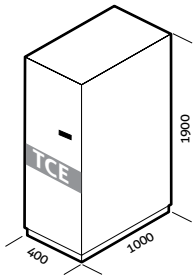


NOTE : The layout of controls and connectors may vary based on the size of the UPS

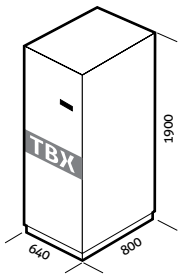
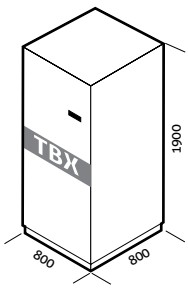
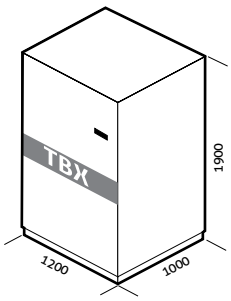
BATTERY BOX

MODELS	BB 1900 480-V6 / BB 1900 480-V7 BB 1900 480-V8 / BB 1900 480-V9
UPS MODELS	MHT 100-600
Dimensions (mm)	

CABINETS WITH TOP ACCESS FOR CABLES

MODELS	TCE MHT 100-250	TCE MHT 300-600
UPS MODELS	MHT 100-250	MHT 300-600
Dimensions (mm)		

THREE-PHASE ISOLATION TRANSFORMERS

MODELS	TBX 100 T - TBX 160 T	TBX 200 T - TBX 250 T	TBX 300 T - TBX 600 T
UPS MODELS	MPT 100-160 / MHT 100-160	MPT 200 / MHT 200-250	MHT 300-600
Dimensions (mm)			

MODELS	MHT 100	MHT 120	MHT 160	MHT 200	MHT 250	MHT 300	MHT 400	MHT 500	MHT 600
INPUT									
Nominal voltage	380 - 400 - 415 Vac three-phase								
Frequency	45 - 65 Hz								
Power factor	> 0,99								
Harmonic current distortion	<3% THDi								
Soft start	0 - 100% in 120'' (selectable)								
Frequency tolerance	± 2% (selectable from ± 1% to ± 5% from front panel)								
Standard equipment provided	Back Feed protection; separable bypass line								
BYPASS									
Nominal voltage	360-400-420 Vac three-phase + N								
Nominal frequency	50 or 60 Hz (selectable)								
OUTPUT									
Nominal power (kVA)	100	120	160	200	250	300	400	500	600
Active power (kW)	90	108	144	180	225	270	360	450	540
Number of phases	3 + N								
Nominal voltage	380 - 400 - 415 Vac three-phase + N (selectable)								
Static stability	± 1%								
Dynamic stability	± 5% in 10 ms								
Voltage distortion	< 1% with linear load / < 3% with non-linear load								
Crest factor	3:1 lpeack/lrms								
Frequency stability on battery	0.05%								
Frequency	50 or 60 Hz (selectable)								
Overload	110% for 60'; 125% for 10'; 150% for 1'								
BATTERIES									
Type	VRLA AGM / GEL; NiCd; Supercaps; Li-ion; Flywheels								
Ripple current	Zero								
Recharge voltage compensation	-0.5 Vx°C								
INFO FOR INSTALLATION									
Weight (kg)	656	700	800	910	1000	1400	1700	2100	2400
Dimensions (WxDxH) (mm)	800 x 850 x 1900		1000 x 850 x 1900			1500 x 1000 x 1900		2100 x 1000 x 1900	
Remote signals	dry contacts (configurable)								
Remote controls	ESD and bypass (configurable)								
Communications	Double RS232 + dry contacts + 2 slots for communications interface								
Operating temperature	0 °C / +40 °C								
Relative humidity	<95% non-condensing								
Colour	Dark grey RAL 7016								
Noise level at 1 m	63 - 68 dBA					70 - 72 dBA			
IP rating	IP20 (others on request)								
Smart Active efficiency	up to 98.5%								
Standards	Safety: EN 62040-1-1 (Directive 2006/95/EC); EMC: EN 62040-2 (Directive 2004/108/EC)								
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111								
Moving the UPS	transpallet								

DATACENTER E-MEDICAL INDUSTRY TRANSPORT EMERGENCY

VFI TYPE ONLINE

Master HP UL

3:3 65-250 kVA

UL certified

SmartGrid ready

Flywheel compatible

Supercaps UPS

Service 1st start

HIGHLIGHTS

- **High efficiency (up to 98.5%)**
- **IGBT-based rectifier technology**
- **Compact and reliable**
- **Galvanic isolation**
- **High overload capacity**
- **North American voltage**

The incredible levels of quality, reliability and energy savings offered by the Master HP range of UPS have been extended to include a 480 Vac - 60 Hz version, certified as UL, with power ratings from 65 to 250 kVA.
IT department managers, facility managers and CTOs are under increasing pressure to achieve zero downtime and to size data centre or industrial installations to be flexible in the face of continuous changes and expansion. As the search for the most reliable and efficient power supply system becomes ever-increasingly critical, Riello UPS has been continuously investing in power solutions to meet the demands of a range of our clients; a commitment that resulted in the Master HP UL range.

More than just an innovative and technologically-advanced UPS, it is a leap into the future of three-phase technology.

Thanks to its double conversion on-line technology based entirely on IGBT and digital signal processors (DSP), the Master HP UL range ensures maximum power supply protection and quality for any type of load, IT or industrial, in particular for mission critical applications, with VFI SS 111 classification (Voltage and Frequency Independent) in accordance with IEC EN 62040-3. This range was designed using a new configuration that includes an IGBT sinusoidal input rectifier instead of the conventional thyristor system.

Differently from other UPS technologies available on the market, double conversion technology with galvanic isolated output guarantees a quality power supply that is completely protected from all electrical anomalies at the input. Even in the event of serious power supply problems, the output power remains stable.

Zero impact source

Master HP UL features the added advantages of the Zero Impact Source formula offered by an IGBT-based rectifier assembly. This eliminates problems connected with installation in networks
with limited power capacity, where the UPS is supplied by a generator set or in any case anywhere there are compatibility problems with loads that generate current harmonics. Master HP UL has zero impact on the power supply source, whether it is a mains grid or generator set:

- input current distortion < 3%
- input power factor 0.99
- power walk-in function that ensures progressive rectifier start up
- start-up delay function, to restart the rectifiers when mains power is restored if there are several UPS in the system.

Master HP UL also performs the role of a filter and power factor corrector, protecting the upstream power supply from any harmonics and reactive power generated by the consumers.

Battery Care System: maximum battery care

Master HP UL uses the Battery Care System, which optimises battery performance in order to extend the battery life for as long as possible.

Flexibility

The output isolation transformer ensures the galvanic isolation of the load towards the battery and improved versatility in system configuration: it allows for two truly separate network inputs (main and emergency), coming from two different power sources; this is particularly suited to parallel systems in order to ensure selectivity between the two sources, thus improving the reliability of the entire installation.

OPTIONS

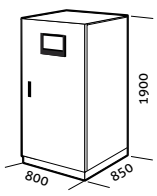
SOFTWARE
PowerShield[3]
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
56K MODEM
GSM MODEM

PRODUCT ACCESSORIES
Isolation transformer
Synchronisation device (UGS): *see Master MPS on page 84*
Hot connection device (PSJ): *see Master MPS on page 84*
Generator interface
Parallel configuration kit (Closed Loop)
Battery cabinets empty or for extended runtimes
Top Cable Entry cabinets
IP rating IP31/IP42

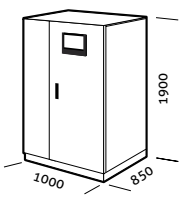
DIMENSIONS

MHT UL 65 - MHT UL 80
MHT UL 100 - MHT UL 125



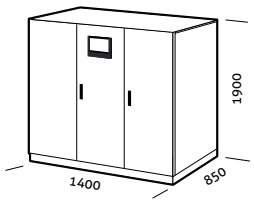
including manual bypass

MHT UL 160 - MHT UL 200
MHT UL 250



excluding manual bypass

MHT UL 160 - MHT UL 200
MHT UL 250



including manual bypass
Top Cable Entry cabinets

MODELS	MHT UL 65	MHT UL 80	MHT UL 100	MHT UL 125	MHT UL 160	MHT UL 200	MHT UL 250
INPUT							
Nominal voltage	480 Vac three-phase + N						
Frequency	45 - 65 Hz						
Power factor	> 0.99						
Harmonic current distortion	<3% THDi						
Soft start	0 - 100% in 30'' (selectable)						
Frequency tolerance	± 2% (selectable from ± 1% to ± 5% from front panel)						
Standard equipment provided	Back Feed protection; separable bypass line						
BATTERIES							
Type	VRLA AGM / GEL; NiCd; Li-ion; Supercaps and Flywheel						
Ripple current	Zero						
Recharge voltage compensation	-0.5 Vx°C						
OUTPUT							
Nominal power (kVA)	65	80	100	125	160	200	250
Active power (kW)	58.5	72	90	112.5	144	180	225
Number of phases	3 + N						
Nominal voltage	480 Vac three-phase + N						
Static stability	± 1%						
Dynamic stability	from ± 5% to ± 1% in 20 ms						
Voltage distortion	< 1% with linear load / < 3% with non-linear load						
Crest factor	3:1 lpeack/lrms						
Frequency stability on battery	0.05%						
Frequency	60 Hz						
Overload	110% for 60'; 125% for 10'; 150% for 1'						
INFO FOR INSTALLATION							
Weight (lbs [kg])	1213 [550]		1433 [650]	1544 [700]	2326 [1055] *	2546 [1155] *	2767 [1255] *
Weight without manual bypass (lbs [kg])	-		-	-	1984 [900]	2205 [1000]	2425 [1100]
Dimensions (WxDxH) (inches [mm])	31.5 x 33.5 x 75 [800 x 850 x 1900]				55 x 33.5 x 75 [1400 x 850 x 1900] *		
Dimensions without manual bypass -(WxDxH) (inches [mm])	-				39 x 33.5 x 75 [1000 x 850 x 1900]		
Remote signals	dry contacts (configurable)						
Remote controls	ESD and bypass (configurable)						
Communications	Double RS232 + dry contacts + 2 slots for communications interface						
Operating temperature	0 °C / +40 °C						
Relative humidity	<95% non-condensing						
Colour	Dark grey RAL 7016						
Noise level at 1 m	65 dBA			68 dBA			
IP rating	IP20 (others on request)						
Smart Active efficiency	up to 98.5%						
Standards	UL Standard 1778: 2nd edition from 65 to 125 kVA, 4th edition from 160 to 250 kVA; National Electrical Code (NFPA-70); NEMA PE-1; CUL - CSA C22.2; ASME; ASA-C-39.1-1984; FCC section 15 subsection J class A; NEC; OSHA; IEEE 587; ANSI C 62.41-1980; ISO 9000						
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111						
Moving the UPS	transpallet						

** with Top Cable Entry*

INDUSTRY TRANSPORT

VFI TYPE
ONLINE

Master Industrial

3:1 30-80 kVA
DC BUS 220 Vdc

ECO LEVEL 4

service
Service
1st start

HIGHLIGHTS

- **Battery voltage: 220 Vdc**
- **Galvanic isolation of input and output**
- **High short-circuit current**
- **Redundant ventilation**

Industrial application protection

Master Industrial series UPS provide maximum protection and power quality for any type of load, especially industrial applications, such as manufacturing and petrochemical processes, electrical distribution and power plants. Master Industrial is an on-line double conversion UPS (class VFI SS 111 in accordance with IEC EN 62040-3) with input and output isolation transformers.

Industrial environment

Master Industrial is suited to the most demanding installation environments where there are vibrations, mechanical stresses, dust and in general where operating conditions are unfavourable to products created for the standard UPS market.

High ICC

The high short-circuit current (ICC = 3) makes it suitable for loads that require high current peaks during switch-on or during normal operation.

DC voltage 220 V

The input and inverter transformers guarantee the isolation of the batteries, which are sized for a voltage of 220 Vdc (from 108 to 114 elements), the standard industrial value.

Redundant ventilation

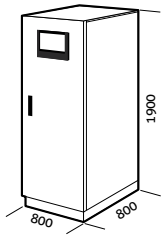
Redundant ventilation at 100% load is standard, ensuring operation with a normal load with half of the fans operating; in addition, each fan is monitored and an alarm signal is provided in the event of failure.
The Easy Source input features, the Battery Care System, and the flexibility and communications capabilities are the same as those of the conventional Master MPS range (page 82).

OPTIONS

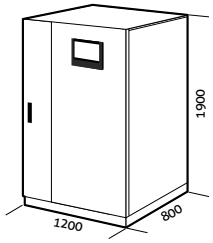
SOFTWARE & ACCESSORIES
See Master MPS
PRODUCT ACCESSORIES
Isolation transformer
Synchronisation device (UGS)
Hot connection device (PSJ)
Generator interface
Parallel configuration kit (Closed Loop)
Battery cabinets empty or for extended runtimes
Top Cable Entry cabinets
IP rating IP31/IP42

DIMENSIONS

MIM 30 - MIM 40



MIM 60 - MIM 80



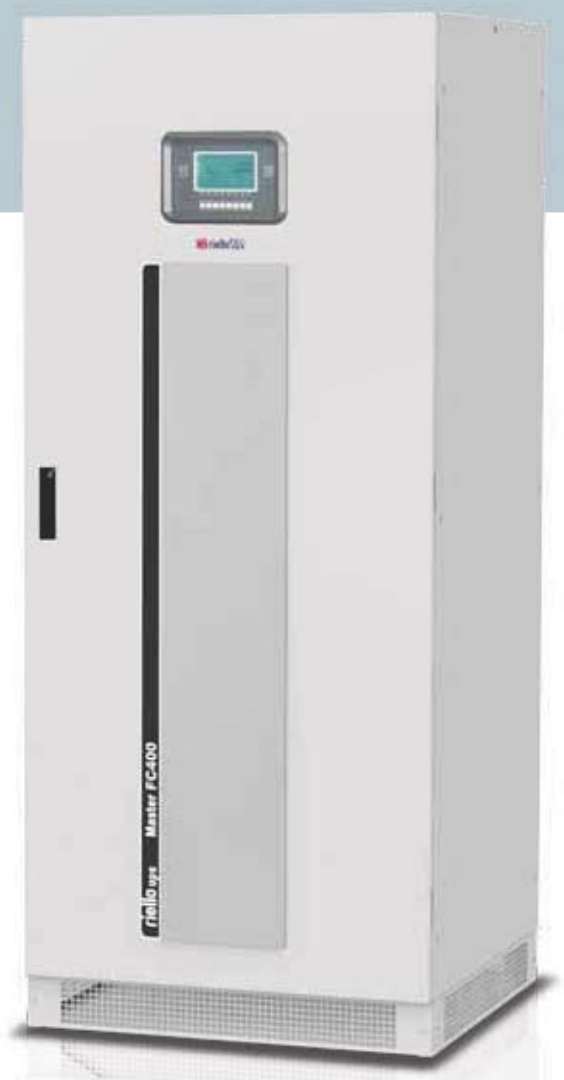
MODELS	MIM 30	MIM 40	MIM 60	MIM 80
INPUT				
Nominal voltage	380 - 400 - 415 Vac three-phase			
Voltage tolerance	400 V ± 20%			
Frequency	45 - 65 Hz			
Power factor	> 0.93			
Current distortion	< 6%			
Soft start	0 ÷ 100% in 120'' configurable			
Permitted frequency tolerance	± 2% (selectable from ± 1% to ± 5% from front panel)			
Standard equipment provided	Back Feed protection; separable bypass line; battery isolation			
BATTERIES				
Type	VRLA AGM / GEL; NiCd			
Number of cells	108/114			
Maximum charging voltage	274 V			
Temperature compensation	-0.5 Vx°C			
OUTPUT				
Nominal power (kVA)	30	40	60	80
Active power (kW)	24	32	48	64
Nominal voltage	230 Vac single-phase			
Static stability	± 1%			
Dynamic stability	± 5%			
Voltage distortion	< 1% with linear load / < 3% with non-linear load			
Frequency	50 or 60 Hz (selectable)			
Crest factor	3:1 lpeack/lrms			
Overload	110% for 60'; 125% for 10'; 150% for 1'			
Short-circuit current	3 I nom.			
INFO FOR INSTALLATION				
Weight (kg)	640	650	910	940
Dimensions (WxDxH) (mm)	800 x 800 x 1900		1200 x 800 x 1900	
Remote signals	dry contacts			
Remote controls	ESD and bypass			
Communications	Double RS232 + dry contacts + 2 slots for communications interface			
Operating temperature	0 °C / +40 °C			
Relative humidity	<95% non-condensing			
Colour	Light grey RAL 7035			
Noise level at 1 m	68 ÷ 70 dBA			
Ventilation	Redundant fans (front-top)			
IP rating	IP20			
Efficiency	up to 94%			
Standards	Directives LV 2006/95/EC - 2004/108/EC; Safety IEC EN 62040-1; EMC IEC EN 62040-2; Performance IEC EN 62040-3			
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111			
Moving the UPS	transpallet			

TRANSPORT

VFI TYPE
ONLINE

Master FC400

3:3 30-120 kVA



ECO LEVEL 4

service
Service
1st start

HIGHLIGHTS

- **Frequency converter 50/400 Hz**
- **Output voltage: 208 V - 3F**
- **Galvanic isolation**
- **Applications: airport, military and naval**

Master FC400 series static frequency converters are available from 30 to 120 kVA, with 50 or 60 Hz input and 400 Hz output. The result of extensive experience acquired in the UPS industry, the Master FC 400 series is distinguished by the use of technologically advanced components and for excellent reliability, ease of maintenance and ease of operation.
The Master FC400 series uses double conversion technology (VFI SS 111 voltage and frequency independent compliant with IEC EN 62040-3), with an integrated output transformer to ensure the galvanic isolation of the load from mains disturbances under all conditions.
The output voltage is 208 Vca three-phase (200/115V versions upon request).
Thanks to high frequency IGBT technology and digital control, Master FC400 frequency converters are ideal for airport, military and naval applications.

Minimum impact on mains – easy source

The Master FC400 was designed to reduce to a minimum the impact on the mains or generator located upstream, thanks to the low harmonic content input and the progressive start of the rectifier.
These features make the Master FC400 frequency converters especially compatible with generators.

Easy installation and maintenance

The Master FC400 requires a small space for installation (only 0.86m² for a 120kVA model).
The main assemblies of the UPS can be easily accessed for maintenance, via the removable front panel. Fans located in the top of the UPS cabinet, eliminate the need for side or rear access, and allow the UPS to be placed against a wall.

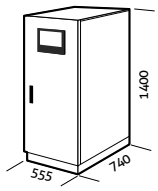
Applications

Master FC400 provides additional protection for a wide range of applications, including:

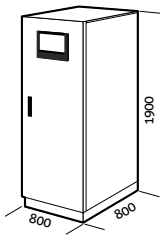
- Powering airplanes in airports
- Radar and flight-control systems
- Naval applications
- Military applications
- Power for test benches.

DIMENSIONS

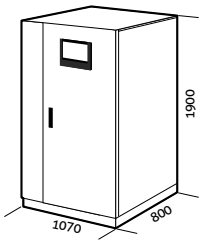
MFC 30



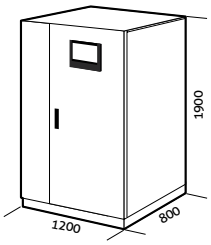
MFC 60 - MFC 80
MFC 100 - MFC 120



MFC 60 D - MFC 80 D
MFC 100 D



MFC 120 D



OPTIONS

SOFTWARE & ACCESSORIES
See Master MPS

PRODUCT ACCESSORIES
Input isolation transformer

IP rating IP31/IP42
Parallel configuration kit (Closed Loop)
Twelve-phase version (D)
Filtering of 5th and 11th harmonics (HC)
Top Cable Entry cabinets
Generator interface

MODELS	MFC 30	MFC 60	MFC 80	MFC 100	MFC 120
INPUT					
Nominal voltage	380 - 400 - 415 Vac three-phase				
Voltage tolerance	400 V ± 20%				
Frequency	45 - 65 Hz				
Current distortion	< 5% C (HC Version)				
Soft start	0 - 100% in 120'' configurable				
OUTPUT					
Nominal power (kVA)	30	60	80	100	120
Active power (kW)	24	48	64	80	96
Nominal voltage	208 Vac three-phase + N				
Static stability	± 1%				
Dynamic stability	± 5%				
Voltage distortion	< 3% with linear load / < 4% with non-linear load				
Frequency	400 Hz				
Crest factor (Ipeack/Irms)	3/1				
Overload	110% for 60'; 125% for 10'; 150% for 1'				
INFO FOR INSTALLATION					
Weight (kg)	330	480	500	530	560
Dimensions (WxDxH) (mm)	555 x 740 x 1400	800 x 800 x 1900			
Remote signals	dry contacts				
Remote controls	ESD and ON/OFF				
Communications	Double RS232 + dry contacts + 2 slots for communications interface				
Operating temperature	0°C / +40°C (50°C @ 75% load)				
Relative humidity	<95% non-condensing				
Colour	Light grey RAL 7036				
Noise level at 1 m	62 dBA	65 dBA	68 dBA	70 dBA	72 dBA
IP rating	IP20 (others on request)				
Efficiency	up to 92%				
Standards	Directives LV 2006/95/EC - 2004/108/EC; Safety IEC EN 62040-1; EMC IEC EN 62040-2; Performance IEC EN 62040-3				
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111				
Moving the UPS	transpallet				

DATACENTER INDUSTRY TRANSPORT

Master Static Bypass

3:3 800-3000 kVA

Service
1st start

HIGHLIGHTS

- **Flexibility**
- **The ideal solution for installations with UPS in parallel greater than 1 MVA**
- **High system reliability**
- **Centralised diagnostics**

The centralised bypass is an alternative to the distributed bypass. Technically the two solutions fulfil the same purpose, i.e. to guarantee power continuity, but have different architectures.
Whilst it is true that distributed bypass solutions are the most common due to their flexibility of use and low initial cost, it is also true that in the medium/large data centre market centralised bypass solutions are preferable in terms of technical performance, footprint and sometimes cost, above all in large installations where the number and type of protections as well as system wiring have an impact.
The data centre and data-storage market in general is destined for large growth. It is therefore important to respond to the various requirements with flexible solutions that are able to adapt to the growing demands of the market in terms of the levels of power and performance required.

Flexibility

The Riello UPS centralised bypass (named MSB) is available in four standard power ratings: 800, 1200, 2000 and 3000 kVA. Intermediate solutions within this range can be made, as well as solutions greater than 3000 kVA based on the requirements of the customer or application.
The MSB centralised bypass can be integrated with the Master HP range; in fact it can be associated with up to 7 UPS modules in the range, obviously without static bypass and associated bypass line

(named MHU). Based on requirements, MSB can also be compatible with the Master MPS range, thus ensuring complete flexibility aimed at satisfying all power and power supply requirements.
Riello UPS provides the same flexibility as the Master HP for the battery bus, so that the MHU units can operate with both shared or separate batteries.
The 800 kVA MSB is supplied with a comprehensive cabinet including bypass line input switch (SWBY), system output switch (SWOUT) and manual bypass (SWMB).
The 1200 kVA model is supplied as standard without any switches but can be equipped with the same, suitably proportioned, switches provided for the 800 kVA model (SWBY, SWOUT, SWMB).
The more powerful models are supplied with no switches; the bulky sizes of disconnection devices at these power levels are such as to favour tailor-made engineering solutions as an additional part of the system attestation and distribution cabinets where the centralised bypass and MHU modules are fitted.

The ideal solution for installations with UPS in parallel greater than 1 MVA

Medium-high power systems are often comprised of N UPS of small-medium power ratings arranged in parallel. It is clear that the larger the size of the individual UPS modules or the number of units configured in parallel, the more complex and extensive the system wiring shall be. Particular attention should be paid to the length of the power lines for the individual UPS bypasses, so that they are equidistant from the common points. Even minimal variations in the line impedances of the individual bypasses can cause current equipartition problems between the UPS and associated overcurrent in the cables whenever they supply from the bypass. This can lead to the inappropriate cut-in of protection devices and can generate heat, with the end result of minimising power continuity and increasing power consumption for cooling the system.
The Riello UPS centralised bypass (MSB) is the ideal solution for eliminating all critical issues connected with power distribution over bypass lines. When activated, all power flows through a single static bypass module, ensuring:

- High reliability
- Improved energy efficiency
- Exceptional ability to withstand short-circuits downstream of the system
- Centralised system control both with regards to accessibility to system information and with regards to manoeuvrability since the system is equipped with a single manual system bypass.

By opting for the solution with a centralised bypass, the individual MHU units are provided without integrated static bypasses, thus eliminating critical components (static circuit and associated line protections such as disconnectors and/or fuses). This translates into a lower installation cost by eliminating the cables for the auxiliary power supply lines to the individual modules.
These advantages grow exponentially as the power levels at play and number of modules increase. This is why the centralised bypass solution is technically and economically preferable for power levels above one megawatt.

High system reliability

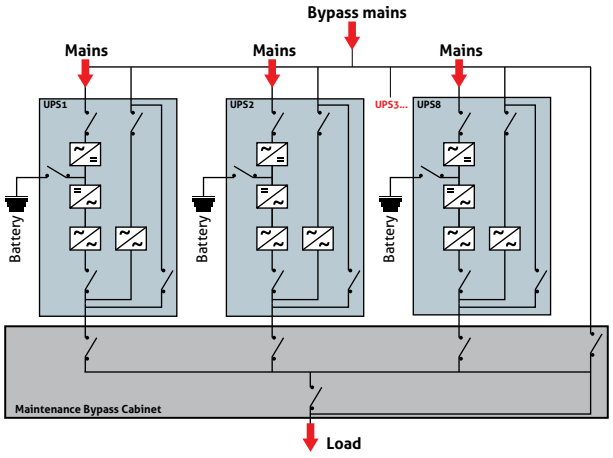
When compared to a solution with a distributed bypass and a considerable number of UPS modules arranged in parallel (more than 4), the MSB solution significantly reduces the amount of components (SCR, switches, control elements for individual static bypasses, coupling inductances), consequently increasing system reliability.

Power supply from bypass line: "On Line" mode

Recent design philosophies for data centres are pushing towards making systems operate on bypass lines not only in the event of an emergency, but as an alternative to "ON-Line" mode, thus improving system efficiency. For this reason power circulation through a single line (centralised bypass), eliminates all problems connected with current distribution, which must be ensured in the event of the operation of UPS modules in parallel with distributed by-passes. The greater the power rating of the UPS, the exponentially greater the risk of minimal impedance differences in the bypass lines generating large imbalances in current circulation, with a serious risk of protection cut-in, compromising power supply continuity. With the centralised bypass the static circuit is single and independent and the current flows through a single channel, ensuring immunity from interaction problems between individual UPS units.

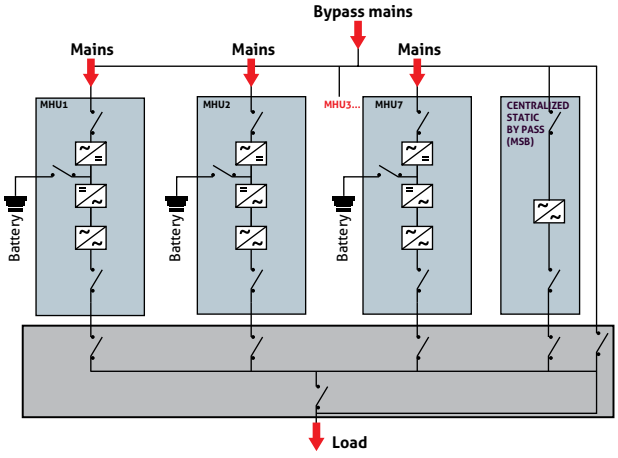
PARALLEL CONFIGURATION OF UP TO 8 UPS UNITS WITH DISTRIBUTED BYPASS

Parallel architecture to ensure redundancy of the power source.
+ Flexibility and modularity and no single point of failure.



PARALLEL CONFIGURATION OF UP TO 7 MHU UNITS WITH CENTRALISED BYPASS

Parallel architecture to ensure redundancy of the power source, with autonomous bypass management.
+ Selectivity of downstream faults in bypass mode



Power supply from bypass line: in an emergency

The static bypass is a support device aimed at ensuring power continuity in the event of inverter failure. In the event of N UPS configured in parallel the failure of a single inverter module should automatically exclude it from the parallel system, ensuring the correct operation of the other units and the reliability of the system.
For this reason automatic switching to bypass lines takes place only when there is a serious fault with the inverter or due to external forces, such as a short circuit downstream of the system.
These events are both rapid and unpredictable and, based on the power available on the line, can generate short circuit currents that can be extremely high. In the event of distributed parallel configurations where N static by-passes are arranged in parallel, minimal differences (even in the order of fractions of a millisecond), can generate uncontrolled transients and current flow between UPS units such as to trigger protection devices or even damage the bypass thyristors.
Riello UPS are equipped with sophisticated parallel control logics that ensure synchronism between the various units arranged in parallel under all operating conditions. The Riello MSB centralised bypass in any case ensures complete immunity from any problem connected with switching synchronism between modules even in the most extreme cases as long as the static module is single and independent.
In addition, differently from a distributed parallel configuration of the same power rating, the centralised bypass can be oversized to guarantee increased overload capacity and the ability to withstand short circuits.
The ventilation system for the MSB static bypass is designed to guarantee operation even in the event of the failure of several fans. In order to constantly monitor the status of the fans, a control circuit can be provided to control the operation of each individual ventilation fan.

Centralised diagnostics

The use of the MSB centralised bypass centralises the diagnostics and control of the bypass line.
The display provides information concerning the voltage and current supplied and the status of the individual UPS modules (MHU).
Differently from a system with distributed bypass, the centralised bypass is equipped with a single disconnection device for the bypass line and can be provided with an integrated manual bypass. The single disconnection device guarantees that the manoeuvres are carried out quickly and with a minimum margin of error, guaranteeing once again improved system reliability. The MSB bypass provides dedicated housings for the various remote control systems such as: three-contact relay board (standard), two communications slots and full compatibility with the communications interfaces in the Riello UPS range for UPS in the MHT / MPT ranges.

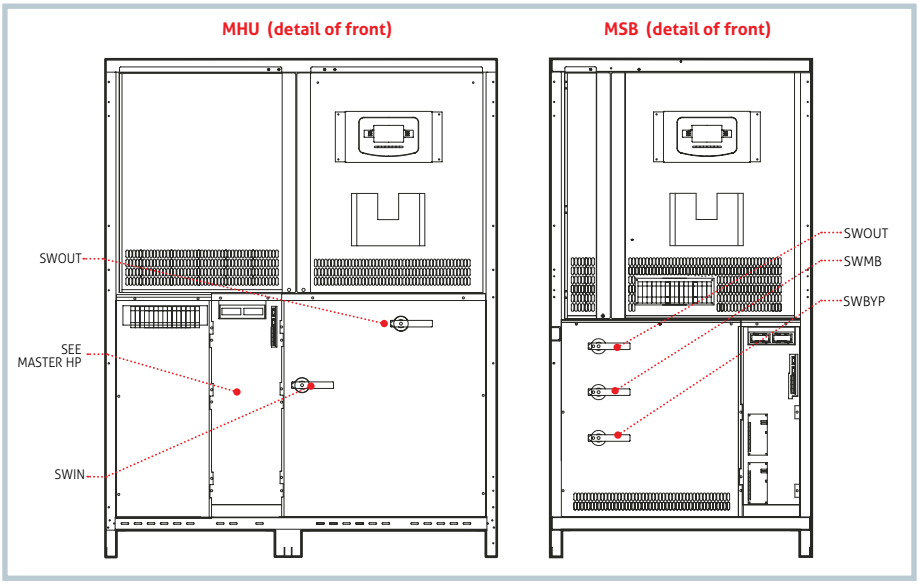
OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

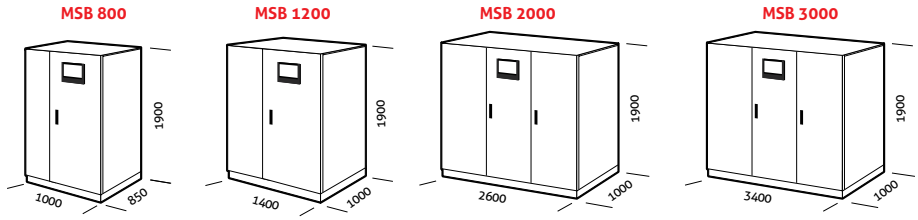
ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352
MULTICOM 401
MULTI I/O
Interface kit AS400
MULTIPANEL
RTG 100
56K Modem
GSM Modem

PRODUCT ACCESSORIES
Top Cable Entry cabinets
IP rating IP31/IP42
Manoeuvring switches

DETAILS



DIMENSIONS



MODELS	MSB 800	MSB 1200	MSB 2000	MSB 3000
OPERATING SPECIFICATIONS				
Nominal power (kVA)	800	1200	2000	3000
Nominal voltage	380 - 400 - 415 Vac three-phase + N			
Input voltage tolerance	± 15% (selectable from ± 10% to ± 25% from front panel)			
Frequency	50/60 Hz			
Frequency tolerance	± 2% (selectable from ± 1% to ± 6% from front panel)			
Standard equipment provided	Back Feed protection			
Permitted overload*	110% for 60 min; 125% for 10 min; 150% for 1 min			
ENVIRONMENTAL SPECIFICATIONS				
Noise at 1 m from front (from 0 to full load)	< 65 dBA			
Storage temperature	-10 °C up to +50 °C			
Operating temperature	0 °C - 40 °C			
Relative humidity	95% non-condensing			
Max. installation height	1000 m at nominal power (-1% power for every 100 m above 1000 m) - Max 4000 m			
Reference standard	EN 62040-1 general safety requirements; IEC 62040-2 electromagnetic compatibility			
INFO FOR INSTALLATION				
Weight (kg)	570	800	1200	2000
Dimensions (WxDxH) (mm)	1000 x 850 x 1900	** 1400 x 1000 x 1900	2600 x 1000 x 1900	3400 x 1000 x 1900
Communications	Double RS232 + dry contacts + 2 slots for communications interface			
Colour	Dark grey RAL 7016			
IP rating	IP20 (others on request)			
Moving the UPS	transpallet			

* under certain conditions ** 1800 mm version with switches

DATACENTER

Multi Switch

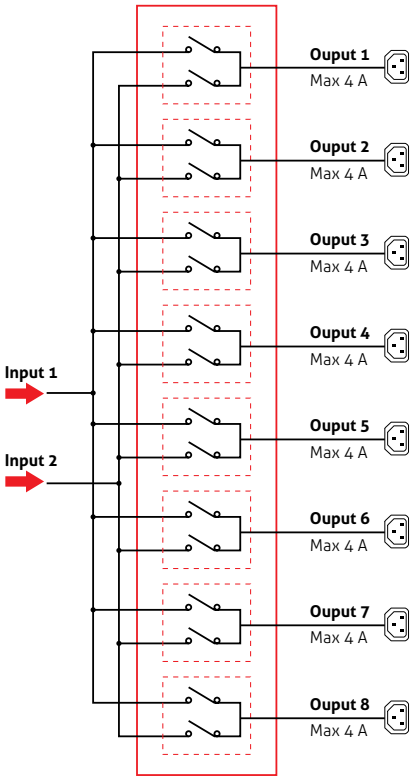
1:1 16 A

P&P

Plug & Play installation

HIGHLIGHTS

- **Redundant power supply**
- **Load protection**
- **Versatile to use**



Multi Switch is a rackmount source transfer switch that can supply up to eight loads from two AC power sources. Should one source fail, the other automatically powers the load. The sources can be two separate AC sources including mains power and UPS, or a combination of the two.

Operating principle

The Multi Switch provides electrical distribution and remote management for up to eight network users, powered from two direct mains supplies or UPS or a combination of both. The Multi Switch can connect each load (up to eight, each with a maximum power demand not greater than 4A), to either of the two power sources (1 and 2). Load demand is shown on the LCD.

Protection against load faults

If one of the two loads fails (i.e. due to a short circuit or overload), Multi Switch will disconnect the load to protect the operation

of the other loads (i.e. in the event of poor selectivity of the protection devices).

Protection against power supply faults

If one of the two power sources falls outside tolerance levels, Multi Switch will transfer the consumers to the second power source (switching is instantaneous if the two sources are in phase).

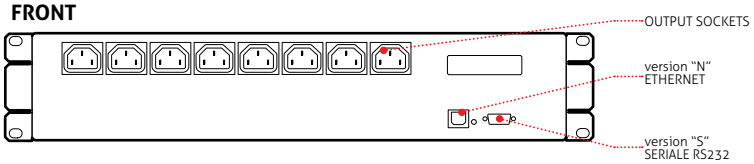
Features

- Full protection for consumers against mains and load failures
- Versatile to use: can be powered with 2 different power supplies (2 UPS even of different sizes/types)
- 19" cabinet installation
- LCD display for monitoring measurements / alarms / status
- Can be connected to PowerNetGuard supervision software (Ethernet version)
- No signal connection between the Multi Switch and the power sources or consumers is necessary
- Display software
- Network interface.

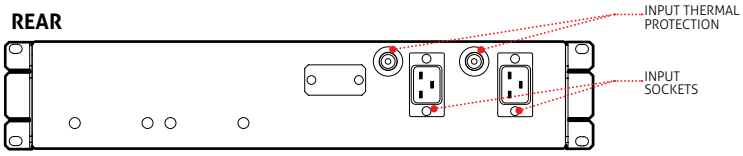
DETAILS

MSW (2 inputs - 8 outputs)

FRONT



REAR



OPTIONS

SOFTWARE
PowerNetGuard

ACCESSORIES
NETMAN 102 PLUS (only with version N)

MODELS	MSW-S	MSW-N
CURRENT	**16 A**	
INPUT		
Nominal voltage	180 - 276 Vac	
Nominal frequency	50/60 Hz	
Max. load for each input	16 A	
Input sockets	2 IEC 320 (16 A)	
OUTPUT		
Nominal voltage	choice of one of the two input power sources	
Max. load for each output	4 A	
Output sockets	8 IEC 320 10 A	
INFO FOR INSTALLATION		
Weight (kg)	10	
Dimensions (WxDxH) (mm)	19" x 360 x 2U	
Operating temperature	0 °C / +40 °C	
Relative humidity	<95% non-condensing	
Protections	Overcurrent - overvoltage - undervoltage - protection against energy back-feed	
Max. altitude	3000 m	
Max. altitude (in storage conditions)	6000 m; 45 °C	
Communications	RS232 port	Ethernet port
Colour	Dark grey RAL 5004	
IP rating	IP20	
Noise level at 1 m	< 35 dBA	

DATACENTER

Multi Switch ATS

1:1 16 A

Plug & Play installation

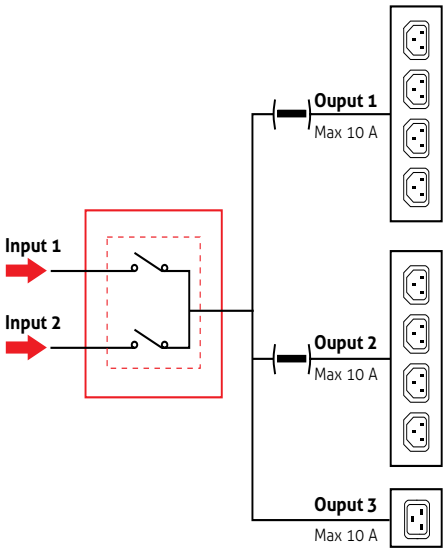
HIGHLIGHTS

- **Redundant power supply**
- **Load protection**
- **Versatile to use**

Multi Switch ATS provides installations with power supply continuity. Its operating principle ensures higher reliability than a single UPS, (with or without its own internal bypass).

Operating principle

Multi Switch ATS provides direct distribution of eight 10 A IEC consumers or one 16 A IEC consumer in a system with two input power lines (two mains inputs, or two UPS).
Multi Switch ATS is able to connect to either of the two input power lines, whilst simultaneously monitoring the power uptake.



Protection against load faults

If one of the loads fails (e.g. short circuit), Multi Switch ATS disconnects the group of sockets where the load is connected, thus

preventing other loads from being switched off (i.e. in the event of poor selectivity of the protection devices).

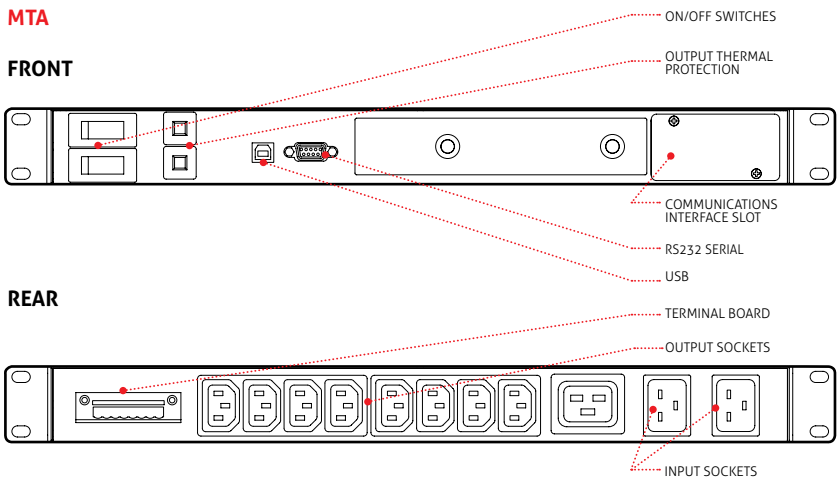
Protection against power supply faults

If one of the two power sources falls outside tolerance levels, Multi Switch ATS will transfer the consumers to the second power source (switching is instantaneous if the two sources are in phase).

Features

- Full protection for consumers against mains and load failures
- Versatile to use: Multi Switch ATS can be powered with 2 different power supplies (2 UPS even of different sizes/types)
- 19" cabinet installation
- Display panel
- Can be connected to PowerNetGuard supervision software
- No signal connection between the Multi Switch ATS and the power sources or consumers is necessary
- Compatible with PowerShield³ software
- Slot for communications boards.

DETAILS



OPTIONS

SOFTWARE
PowerShield³

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352

MODELS	MTA
CURRENT	**16 A**
INPUT	
Nominal voltage	180 - 276 Vac
Nominal frequency	50/60 Hz
Max. load for each input	16 A
Input sockets	2 IEC-320 C20 (16 A)
OUTPUT	
Nominal voltage	choice of one of the two input power sources
Max. load for each output	10 A on IEC-320 C13 - 16 A on IEC-320 C19
Output sockets	4+4 IEC-320 C13 (10 A) + 1 IEC-320 C19 (16 A)
INFO FOR INSTALLATION	
Weight (kg)	6
Dimensions (WxDxH) (mm)	19" x 330 x 1U
Operating temperature	0 °C / +40 °C
Relative humidity	<95% non-condensing
Protections	Overcurrent - overvoltage - undervoltage - protection against energy back-feed
Max. altitude	3000 m
Max. altitude (in storage conditions)	6000 m; 45 °C
Communications	DB with RS232 and USB ports, slot for communications interface, relay contact port
Colour	Dark grey RAL 5004
IP rating	IP20
Noise level at 1 m	< 35 dBA

DATACENTER E-MEDICAL INDUSTRY TRANSPORT

Master Switch STS *Single-phase*

1:1 32-63-120 A

Plug & Play installation

HIGHLIGHTS

- **Operating flexibility**
- **Load protection**
- **Complete diagnostics**
- **Hot Swap function**

Master Switch Single-phase (MMS) is part of the Master Switch range and offers solutions suitable for protecting single-phase loads with different power ratings. MMS is available in three sizes - 32, 63 and 120 A - and is therefore able to satisfy various requirements for the protection of single-phase loads.

Flexibility of use

All MMS versions are designed with criteria that facilitate on-site installation as well as diagnostics, control and maintenance operations. All models are equipped with a manual bypass and the hot swap function allows for rapid corrective interventions by non-specialised personnel in the event of faults.

Load protection

With MMS transfer switch loads are protected against critical environmental situations and mains power interference. Microprocessor control and the use of thyristor static switches ensure continuous monitoring of the power supply sources and reduced switching times between the two sources in the event of a fault. The constant monitoring of the output current allows for the rapid identification of any short circuit currents in the consumers, preventing short circuits from propagating to other loads. MMS is equipped with thermal-magnetic protection for the two sources, ensuring rapid intervention in the event of faults and integrated back feed protection.
MMS ensures switching times between the two power sources of less that a quarter of a cycle, both in the event of manual switching and in the event automatic switching triggered by a fault in the power source.

Complete diagnostics

All MMS versions are equipped with 32-character LCD displays and control panels with multi-function keys. This allows for rapid and intuitive monitoring of supply readings, switch status and environmental conditions. MMS is equipped with three standard programmable dry contacts, an

MODELS	MMS 32	MMS 63	MMS 120
NOMINAL CURRENT (A)	**32**	**63**	**120**
INPUT			
Nominal voltage - sources S1/S2	220 - 230 - 240 Vac single-phase + N		
Input voltage tolerance	180-264 Vac (selectable)		
Switched input phases	ph+N (two poles)		
Nominal frequency	50/60 Hz		
Input frequency tolerance range	+/-10% (selectable)		
Distribution compatibility	IT, TT, TNS, TNC		
OPERATING SPECIFICATIONS			
Transfer type	"Break Before Make" (no overlapping sources)		
Intervention method in the event of failure	hot swap function		
Available transfer methods	Automatic / Manual / Remote		
Transfer time following source failure	< 4 msec (S1/S2 synchronised) 10 msec (S1/S2 non synchronised)		
ENVIRONMENTAL SPECIFICATIONS			
Efficiency at full load	> 99%		
Noise at 1 m from front (from 0 to full load)	< 40 dBA		
Storage temperature	-10 °C up to +50 °C		
Operating temperature	0 °C - 40 °C		
Relative humidity	90% non-condensing		
Max. installation height	1000 m at nominal power (-1% power for every 100 m above 1000 m) - Max 4000 m		
Reference standard	EN 62310-1 (safety) EN 62310-2 (electro-magnetic compatibility)		
INFO FOR INSTALLATION			
Weight (kg)	10	12	20
Dimensions (WxDxH) (mm)	19" x 520 x 2U		19" x 520 x 3U
Colour	RAL 7016		
IP rating	IP 20		

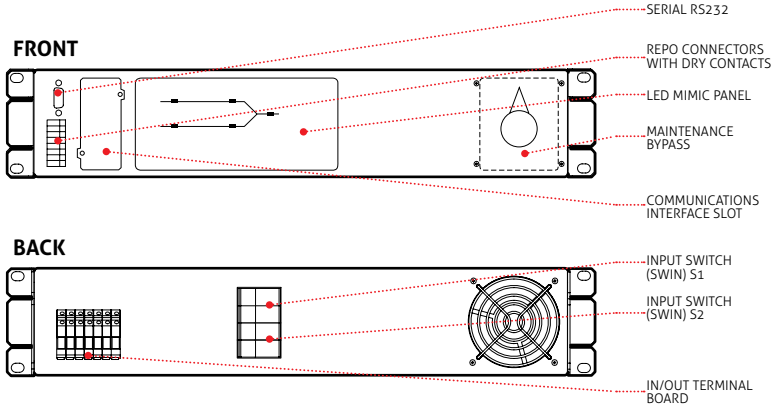
input for emergency shutdown, a 232 serial connection and a slot for housing the expansion board, thus ensuring complete availability of interface solutions for remote control and monitoring.

OPTIONS

SOFTWARE
PowerShield³
PowerNetGuard

ACCESSORIES
NETMAN 101 PLUS
NETMAN 102 PLUS
NETMAN 202 PLUS
MULTICOM 301
MULTICOM 302
MULTICOM 351
MULTICOM 352

DIAGRAM



DATACENTER E-MEDICAL TRANSPORT EMERGENCY

Master Switch STS *Three-phase*

3:3 100-600 A

service
Service
1st start

HIGHLIGHTS

- **High reliability**
- **Hot Replacement function**
- **3- or 4-pole version**
- **Advanced communications**

Installing a Master Switch static transfer switch provides additional resilience and protection from the disruption that can be caused by the failure of a single power source.
The result is the absolute protection of industrial utilities and critical information technology against power supply and load faults.

Operating principle

Master Switch guarantees a source of redundant power, allowing the load to be switched between to alternative and independent power sources.
Switching can be automatic (when a supply source falls outside of acceptable tolerances) or manually done by an operator from the front panel or remotely.

Protection against power supply faults

If one of the two power sources falls outside tolerance levels, Master Switch will transfer the consumers to the second power source (switching is instantaneous if the two sources are in phase).

Protection against environmental disturbances

Overloads and load faults

In the event of an overload, the user can decide the level of intervention of the internal protection devices in order to block

the power supply. In the extreme case of a downstream short circuit, Master Switch disconnects the load in order to avoid jeopardising the operation of the other loads (i.e. in the event of poor selectivity of the protection devices).

Total microprocessor control

Microprocessor control logic ensures:

- Fast and safe switching between power sources
- Monitoring of all parameters via LCD display
- Constant monitoring of SCR operation
- Advanced remote diagnostics (RS232 and TCP/IP).

Redundant design

Power is supplied to the internal logic by two physically separate supply circuits that are fully independent and that can be replaced in **"hot replacement"** mode without causing power supply interruptions to the load. In the event that the power supplied by both sources fails, full system operation is guaranteed by the **"Power Supply back up"** function, which provides auxiliary power supply to the circuits from an external, independent power source.
Master Switch is equipped with a dual redundant ventilation system known as: **"fan redundance plus"**. Thanks to this feature, and in the unlikely event that two fans fail at the same time, those remaining would still be able to dissipate the heat generated at nominal load and with an ambient temperature of up to 40° C.
Also the fans can be replaced in **"hot replacement"** mode, ensuring continuity during the replacement operation.

Superior protection

In the event of an output short circuit, Master Switch blocks the transfer between the two power sources, eliminating the risk of propagating the short circuit and its effects to the other loads.
A back feed control circuit ensures the automatic intervention of the protection devices when a return of power to one of the two Master Switch inputs is detected.

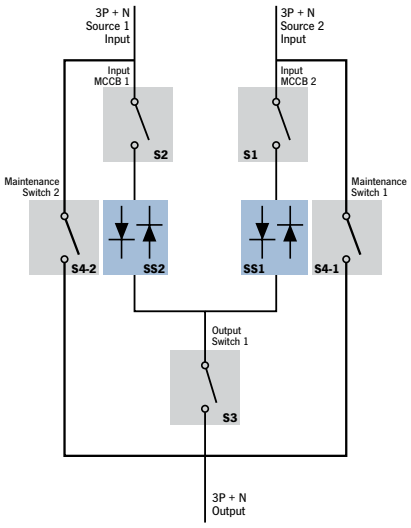
Accessibility

The layout of the moving components and parts is designed to ensure easy frontal access:

- power cable connections that are easily accessed with entry from below
- boards housed in a dedicated area for rapid diagnosis / replacement
- all parts subject to monitoring, maintenance and/or replacement.

Advanced communications

Master Switch provides information, measurements, statuses, and alarms via the LCD display.
The STS is compatible with PowerShield³ supervision and shutdown software for Windows operating systems 8, 7, 2008, Vista, 2003, XP, Linux, Mac OS X and Sun Solaris.



OPTIONS

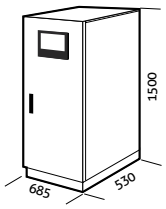
SOFTWARE
PowerShield³

ACCESSORIES
NETMAN 101 PLUS
MULTICOM 301
MULTICOM 351

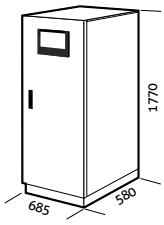
PRODUCT ACCESSORIES
RS232 serial duplicator
"no neutral on input" kit
IP rating IP31

DIMENSIONS

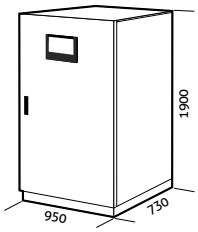
MTS 100
MTS 150



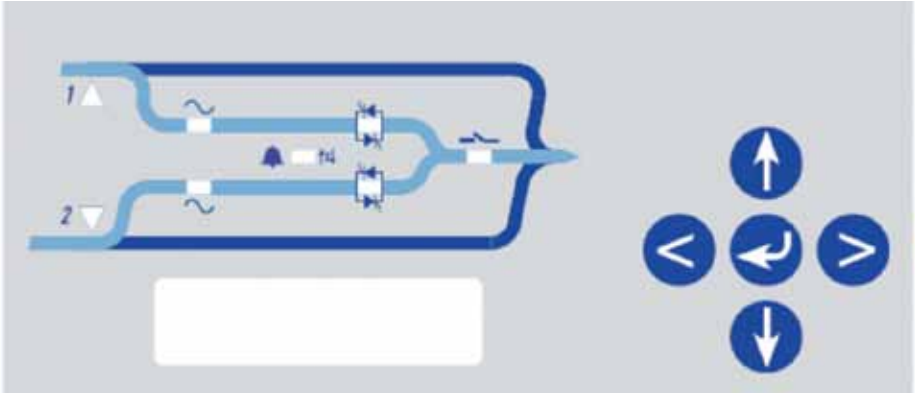
MTS 200 - MTS 250
MTS 300 - MTS 400



MTS 600

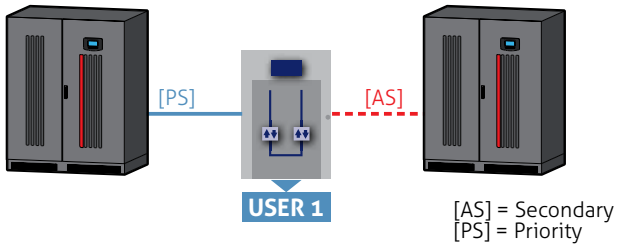


LEDs	FUNCTION
L1	S1 Priority Source
L2	S2 Priority Source
L3	S1 Present
L4	S2 Present
L5	Static transfer switch SS1 closed
L6	Static transfer switch SS2 closed
L7	Alarm indicator
L8	Output selector ON/OFF
5 function keys and LCD operation	



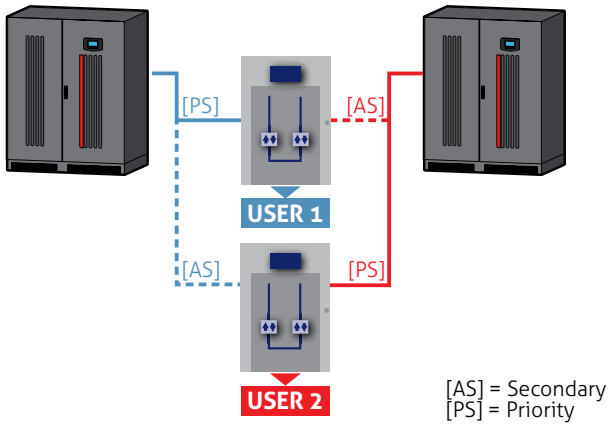
MASTER SWITCH IN **REDUNDANT MODE**

The secondary power source [AS], although highly reliable, only powers the load in the event of a failure with the priority power source [PS], ensuring maximum redundancy and power quality to the loads.



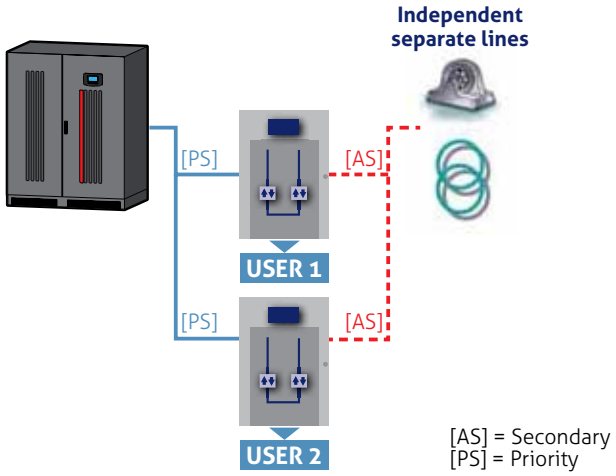
MASTER SWITCH IN **CROSS FEEDING MODE**

The two sources power critical loads using Master Switches configured to selected one of the two power sources as the priority source [PS]. In case of a failure in one of two sources, the other will be able to supply power to all the loads connected to the system).



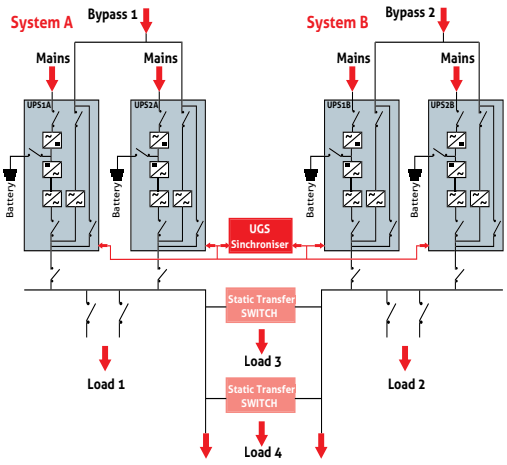
MASTER SWITCH IN **BACK-UP MODE**

Master Switches power utilities via the priority energy source [PS]; the secondary energy source [AS] is made up of independent, separate power sources and to make up for any faults in the priority power source [PS].



DYNAMIC DUAL BUS **CONFIGURATION**

The Riello UPS solution guarantees maximum reliability and ensures continuity of power supply under all operating conditions thanks to the UGS option that keeps the two systems, A and B, perfectly synchronised.
The flexibility of the UGS system ensures synchronism between the sources even when one of the two systems is not a Riello UPS model, but made by another manufacturer, or when the input sources are not from uninterruptible power supplies.



MODELS	MTS 100	MTS 150	MTS 200	MTS 250	MTS 300	MTS 400	MTS 600
NOMINAL CURRENT	**100 A**	**150 A**	**200 A**	**250 A**	**300 A**	**400 A**	**600 A**
INPUT							
Nominal voltage - sources S1/S2	380 - 400 - 415 Vac three-phase + N						
Input voltage tolerance	180-264 Vac (selectable)						
Switched input phases	3+N (4-pole) - 3 (3-pole)						
Nominal frequency	50/60 Hz						
Input frequency tolerance range	+/-10% (selectable)						
Distribution compatibility	IT, TT, TNS, TNC						
OPERATING SPECIFICATIONS							
Transfer type	"Break Before Make" (no overlapping sources)						
Available transfer methods	Automatic / Manual / Remote						
Transfer time following source failure	< 4 msec (S1/S2 synchronised) 10 msec (S1/S2 non synchronised)						
ENVIRONMENTAL SPECIFICATIONS							
Efficiency at full load	> 99%						
Noise at 1 m from front (from 0 to full load)	55 dBA	55 dBA	55 dBA	55 dBA	55 dBA	55 dBA	57 dBA
Storage temperature	-10 °C up to +50 °C						
Operating temperature	0 °C - 40 °C						
Relative humidity	95% non-condensing						
Max. installation height	1000 m at nominal power (-1% power for every 100 m above 1000 m) - Max 4000 m						
Reference standard	EN 62310-1 (safety) EN 62310-2 (electro-magnetic compatibility)						
INFO FOR INSTALLATION							
Weight (kg)	155	160	205	210	235	240	375
Dimensions (WxDxH) (mm)	685 x 530 x 1500		685 x 580 x 1770				950 x 730 x 1900
Colour	RAL 7016						
IP rating	IP 20						
Moving the STS	transpallet						

Power solutions

SuperCaps UPS

SOLUTIONS WITH SUPERCAPS

DATACENTER E-MEDICAL INDUSTRY

HIGHLIGHTS

EXTENDED LIFECYCLE

Thanks to the high number of charge-discharge cycles provided by the super-capacitors (millions or more with respect to the 200 or 300 of lead batteries), the lifecycle is similar to that of a UPS, making this an eco-friendly solution.

REDUCED FOOTPRINT AND WEIGHT

1/4 size of conventional UPS.

HIGH CYCLING EFFICIENCY

Extremely low internal resistance (ESR) with consequent high cycling efficiency (95% or more) and low heat emission.

HIGH TEMPERATURE RESISTANCE

UPS SuperCaps are suitable for installation in particularly hot and cold environments without the need for air conditioning.

SuperCaps module

Riello SuperCaps UPS are designed to provide complete power supply protection for sensitive and mission-critical loads, protecting them from mains disturbances and providing sufficient power to compensate for interruptions in mains supply. SuperCaps UPS are a type of uninterruptible power supply developed by Riello UPS , which use super capacitors to accumulate energy instead of conventional batteries.

Traditionally UPS rely on batteries for accumulating energy, but at least 87% of power supply interruptions last for less than a second(1). SuperCaps UPS provide greater energy efficiency, lower costs and reduced footprints – ideal for installations where floor space is at a premium.

At the heart of the Riello SuperCaps UPS is a sophisticated control system that manages the charge-discharge cycle of the super-capacitors and optimises their lifecycle, which may exceed a million cycles. Their back-up time is dependent on the load but is sufficient to supply it until the mains power is restored or until reserve power from a generator starts automatically.

Most UPS are installed as standard with batteries lasting 5-10 minutes to protect the load against generator start up failure. For modern data centres, electro-medical and industrial applications, an efficient generator set supported by a UPS with a relatively brief autonomy offers the most efficient and effective power continuity solution, with conventional batteries providing sufficient runtime to cover most power interruptions. However, SuperCaps UPS do not have batteries and therefore provide long term savings in terms of battery installation, monitoring, maintenance, replacement and recycling costs. In addition, when compared to the 5-7 year lifecycle of standard batteries, SuperCaps UPS have a theoretically infinite lifecycle. These cost savings, along with the reduced footprint make SuperCaps UPS the ideal solution for critical installations that are particularly sensitive to short power supply interruptions.

(1) Electric Power Research Institute study

SENTINEL**PRO***SC*

MODELS		SEP 700 SC	SEP 1000 SC	SEP 2200 SC
INPUT	Nominal voltage	220-230-240 Vac 1ph		
	Nominal frequency	50/60 Hz		
	Power factor	> 0.99		
	Current distortion	≤7%		
OUTPUT	Nominal power (VA)	700	1000	2200
	Power (W)	560	800	1780
	Nominal voltage	220-230-240 Vac 1ph		
BACKUP	**Autonomy**	**16 s**	**11 s**	**11 s**
	Recharge time (min)	**15-30 min**		
	Expandability	**no**	**yes**	**yes**
DATA	Net weight (kg)	8	8,1	17,6
	Dimensions (WxDxH) (mm)	422 x 235 x 158		446 x 333 x 190

SENTINEL**POWER***SC*

MODELS		SPW 6000 SC	SPT 8000 SC	SPT 10000 SC
INPUT	Nominal voltage	220-230-240 Vac 1ph	220-230-240 Vac 1ph or 380-400-415 Vac 3ph	
	Nominal frequency	50/60 Hz		
	Power factor	> 0.99		
	Current distortion	≤5%		
OUTPUT	Nominal power (VA)	6000	8000	10000
	Power (W)	4800	6400	8000
	Nominal voltage	220-230-240 Vac 1ph		
BACKUP	**Autonomy**	**11 s**	**9 s**	**7 s**
	Recharge time	**15-30 min**		
DATA	Net weight (kg)	61	62	64
	Dimensions (WxDxH) (mm)	785 x 615 x 282		

MULTI**SENTRY***SC*

MODELS		MST 10 SC	MST 12 SC	MST 15 SC	MST 20 SC	MST 30 SC	MST 40 SC	MST 60 SC	MST 80 SC	MST 100 SC	MST 120 SC
INPUT	Nominal voltage	220-230-240 Vac 1ph / 380-400-415 Vac 3ph									
	Nominal frequency	50/60 Hz									
	Power factor	0.99									
	Current distortion	≤ 3%									
OUTPUT	Nominal power (VA)	10	12	15	20	30	40	60	80	100	120
	Power (W)	9	10.8	13.5	18	27	36	54	72	90	108
	Nominal voltage	220-230-240 Vac 1ph / 380-400-415 Vac 3ph									
BACKUP	**Autonomy**	**19 s**	**15 s**	**12 s**	**9 s**	**14 s**	**9 s**	**5 s**	**7 s**	**15 s**	**12 s**
	Recharge time	**6-8 min**									
DATA	Net weight (kg)	123	128	133	138	171	163	190*	200*	220*	380*
	Dimensions (WxDxH) (mm)	850 x 1320 x 440						850 x 1600 x 500			855 x 1900 x 750

* Supercaps are not included in the UPS cabinet

MASTER**HP***SC*

contact our TEC service for configurations.

Power solutions

Master VDC

FLYWHEEL SOLUTIONS

3:3 100-600 kVA
modular

DATACENTER
E-MEDICAL
INDUSTRY
TRANSPORT
EMERGENCY

Flywheel compatible
Service 1st start

HIGHLIGHTS

CLEAN ENERGY

An eco-friendly, battery-free uninterruptible power system.

HIGH EFFICIENCY INNOVATIVE TECHNOLOGY

Modular expansion options for more power and runtime.

LONG OPERATING LIFE

20 year design life for the flywheel component compared with 7 years for a typical battery.

LOW MAINTENANCE COSTS

Easy to install and maintain.

Master VDC is a scaleable system comprised of one or more UPS units and VDC or VDC-XE flywheels. Master VDC is ideal for modern ECO targeted data centres looking to achieve the lowest possible PUE ratios and highest levels of reliability.
Master VDC UPS provide a number of advantages over more traditional battery-equipped systems including: up to 99% efficiency, a compact footprint (up to 50% reduction), lower Total Cost of Ownership (TCO) and almost instantaneous recharge times.
A single flywheel module provides sufficient runtime for the start-up of a local standby generator to power the UPS, which then provides a continuous quality power supply. The entire system can be scaled for reliable power (N+x) and increased runtime via the parallel operation of several UPS and/or flywheel modules (and a small battery pack if required, for additional reliability).
In a standard configuration (1 x UPS and 1 x flywheel), the runtime available is more than sufficient to allow the UPS to ride through short breaks in mains power.

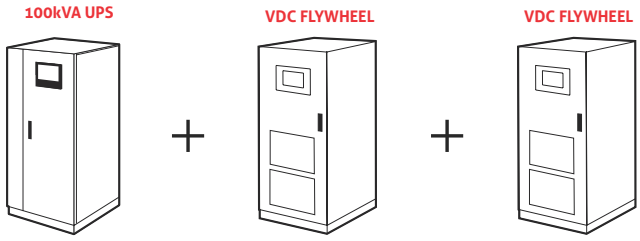
Flywheel VDC and VDC-XE

Thanks to their extremely high levels of reliability, the VDC series of flywheel energy storage systems provide UPS with a secure and reliable source of power that forms the first line of defence against interruptions to the mains power supply; a fundamental defence for all mission critical applications.
The VDC flywheel systems are fully independent standalone devices. They are designed for applications such as data centres, hospitals and industrial installations. They provide a clean source of back up power by converting the kinetic energy stored within a rotating mass into electrical power using a built-in IGBT-based converter.
VDC flywheel systems are available in two models, VDC standard and VDC-XE, which is able to provide superior performance for very short and very high power discharges.
VDC series flywheels store kinetic energy in the form of a rotating mass (spinning at 36,000 RPM) within a vacuum-sealed container. The VDC build technology includes a rotor made from aerospace-grade steel,

MASTER VDC **CONFIGURATIONS**

MODULARITY

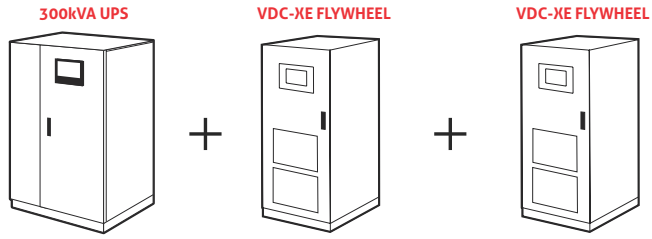
MHF 100



Autonomy:
example with load at 100%:

30s, 1xVDC
1m, 2xVDC

MHF 300

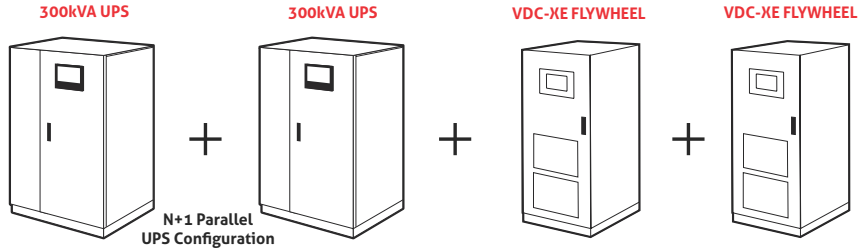


Autonomy:
example with load at 50%:

25s, 1xVDC-XE
52s, 2xVDC-XE

REDUNDANCY (PARALLEL CONFIGURATIONS N+1)

MHF 300P

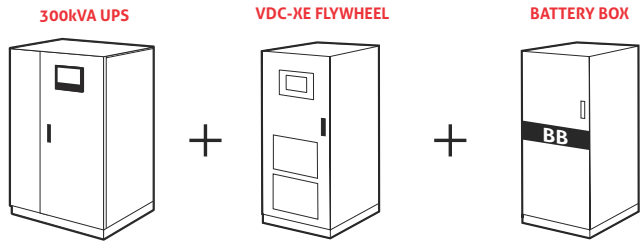


Autonomy:
example with load at 50%:

52s, 2xVDC-XE
or 25s, 1xVDC-XE

BATTERY HARDENING

MHF 300



Autonomy:
example with load at 50%:

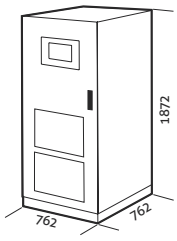
25s, 1xVDC-XE

Plus 10 minutes from an additional battery set

a high speed permanent magnet motor/ generator and contact-free magnetic bearings that levitate and sustain the rotor during operation with no mechanical friction. These technical features allow VDC models to achieve very high levels of efficiency.

DIMENSIONS

VDC / VDC-XE



MASTER VDC: **UPS MODULE SPECIFICATIONS**

MODELS	MHF 100	MHF 120	MHF 160	MHF 200	MHF 250	MHF 300	MHF 400	MHF 500	MHF 600
INPUT									
Nominal voltage	380 - 400 - 415 Vac three-phase								
Frequency	45 - 65 Hz								
Power factor	> 0.99								
Harmonic current distortion	<3% THDi								
Soft start	0 - 100% in 120'' (selectable)								
Frequency tolerance	± 2% (selectable from ± 1% to ± 5% from front panel)								
Standard equipment provided	Back Feed protection; separable bypass line								
BATTERIES									
Type	Flywheels								
Ripple current	Zero								
Recharge voltage compensation	-0.5 Vx°C								
OUTPUT									
Nominal power (kVA)	100	120	160	200	250	300	400	500	600
Active power (kW)	90	108	144	180	225	270	360	450	540
Number of phases	3 + N								
Nominal voltage	380 - 400 - 415 Vac three-phase + N								
Static stability	± 1%								
Dynamic stability	± 5% in 10 ms								
Voltage distortion	< 1% with linear load / < 3% with non-linear load								
Crest factor	3:1 lpeack/lrms								
Frequency stability on battery	0.05%								
Frequency	50 or 60 Hz (selectable)								
Overload	110% for 60'; 125% for 10'; 150% for 1'								
INFO FOR INSTALLATION									
Weight (kg)	656	700	800	910	1000	1400	1700	2100	2400
Dimensions (WxDxH) (mm)	800 x 850 x 1900		1000 x 850 x 1900			1500 x 1000 x 1900		2100 x 1000 x 1900	
Remote signals	dry contacts (configurable)								
Remote controls	ESD and bypass (configurable)								
Communications	Double RS232 + dry contacts + 2 slots for communications interface								
Ambient temperature	0°C / +40°C								
Relative humidity	<95% non-condensing								
Colour	Dark grey RAL 7016								
Noise level at 1 m	63 - 68 dBA					70 - 72 dBA		70 dBA	70 dBA
IP rating	IP20 (others on request)								
Smart Active efficiency	up to 98.5%								
Standards	Safety: EN 62040-1-1 (Directive 2006/95/EC); EMC: EN 62040-2 (Directive 2004/108/EC)								
Classification in accordance with IEC 62040-3	(Voltage Frequency Independent) VFI - SS - 111								
Moving the UPS	transpallet								

MASTER VDC: **FLYWHEEL MODULE SPECIFICATIONS**

MODEL	VDC	VDC-XE
POWER		
Maximum power	215 kW	300 kW
Max. energy storage	3000 kWsec @ 100 kW	4000 kWsec @ 100 kW
Flywheel rotation speed	from 18500 to 36000 rpm	from 14500 to 36750 rpm
INPUT		
Recharge voltage	400-600 Vdc	
Recharge current	15-50 A (adjustable)	
Efficiency	99.2% at max. power	99.4% at max. power
OUTPUT		
Discharge voltage	400-520 Vdc (adjustable)	
Voltage stability	+/- 1%	
Voltage ripple	≤ 2%	
INFO FOR INSTALLATION		
Ambient temperature	-20°C / +40°C	
Relative humidity	95% non-condensing	
Colour	Dark grey RAL 7016	
Noise level at 1 m	≤ 68dBA	
Dimensions (WxDxH) (mm)	762 x 762 x 1872	
Weight (kg)	705	
IP rating	IP 20	
Standards	EMC EN 61000-6-4:2001; EMC EN 61000-6-2:2001; Safety EN 60204-1; Directives: 2004/108/EC; 98/37/EC	

MASTER VDC: **(FLYWHEEL ONLY) RUNTIME IN SECONDS**

VDC 215 kW		MHF 100	MHF 120	MHF 160	MHF 200	MHF 250	MHF 300	MHF 400	MHF 500	MHF 600
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	100%	30	22	13	7	-	-	-	-	-
2		60	50	37	29	20	14	7	-	-
3		89	74	55	44	35	29	18	11	6
4		118	98	73	58	46	39	29	19	13
5		147	123	92	73	58	48	36	29	20
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	75%	41	34	22	15	9	-	-	-	-
2		80	66	50	39	31	24	14	8	-
3		119	99	74	59	47	39	29	20	14
4		157	131	98	78	62	52	39	31	23
5		197	164	123	98	78	65	48	39	32
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	50%	62	51	38	30	21	15	7	-	-
2		120	100	75	60	47	39	29	20	14
3		179	149	112	89	71	59	44	35	29
4		263	197	147	118	94	78	58	46	38
5		295	246	184	147	118	98	73	58	48
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	25%	29	101	76	60	48	40	29	16	14
2		263	196	147	118	94	78	58	46	38
3		350	292	219	175	140	116	87	69	57
4		461	385	289	231	185	154	115	92	76
5		576	481	361	289	231	192	144	115	95

VDC-XE 300 kW		MHF 100	MHF 120	MHF 160	MHF 200	MHF 250	MHF 300	MHF 400	MHF 500	MHF 600
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	100%	40	33	22	15	9	5	-	-	-
2		79	65	49	39	30	24	14	8	-
3		118	98	73	58	46	38	28	20	14
4		156	129	97	77	61	51	38	30	23
5		195	162	121	97	77	60	48	38	31
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	75%	54	45	33	25	17	11	5	-	-
2		106	88	65	52	41	34	24	16	10
3		157	131	98	78	62	51	38	30	23
4		208	173	129	103	82	68	51	40	33
5		260	217	162	129	103	86	64	51	42
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	50%	82	68	51	40	32	25	11	5	4
2		159	132	99	79	63	52	39	30	23
3		237	197	147	118	94	78	58	46	38
4		313	260	195	156	124	103	77	61	51
5		391	326	244	195	156	129	97	77	64
Number of FLYWHEELS	**POWER**	**100**	**120**	**160**	**200**	**250**	**300**	**400**	**500**	**600**
1	25%	39	135	101	80	64	53	39	26	23
2		313	260	195	156	124	103	77	61	50
3		465	387	290	232	185	154	115	92	76
4		614	511	383	306	245	204	152	122	101
5		767	639	479	383	306	255	191	152	126

All runtimes refer to UPS with 0.9pf and 94% efficiency for 100%, 75% and 50% load, and 92% efficiency for 25% load. With no battery connected.

Power solutions

Power Box

CONTAINER SOLUTIONS

HIGHLIGHTS

ECO-COMPATIBLE UPS

Very high efficiency, providing energy savings and reducing operating costs.

COMPACT AND EFFICIENT

The use of flywheels in place of conventional batteries allows for a footprint reduction of 50-75%.

RELIABLE AND RESILIENT MODULES

High reliability is synonymous with UPS with transformers such as the Master HP. Scalable and modular architecture (N+1) of up to 8 UPS arranged in parallel to ensure maximum reliability.

REDUCED RUNNING COSTS

Reduced footprint, fast ROI and high operating efficiency with very low running costs.

EASY MAINTENANCE

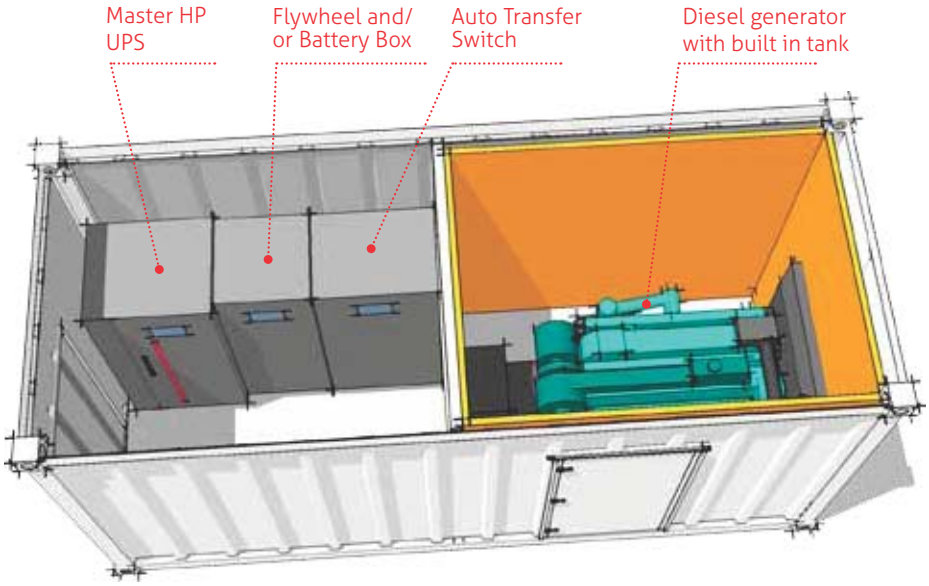
A simple annual inspection accompanied by a minimum amount of preventative maintenance is all that is required to ensure optimum operation.

The PowerBoxes provide a continuous quality power supply wherever and whenever it is needed. Each PowerBox can be configured based on individual project specifications.
PowerBox is a solution in a fully equipped container that can be sent, installed and deployed in the space of a few hours.
Each PowerBox contains all of the necessary switches and protective devices to deliver uninterruptible power from a combination of apparatus that includes: a Riello UPS, a flywheel energy storage system, and a diesel generator.
Master HP is one of the most flexible and efficient UPS on the market. In the event that the mains power supply fails, a conventional UPS makes use of a battery set. In this case clean energy is provided from a flywheel.
The uninterruptible power supplies available can be configured in modular blocks from 200 kVA to 600 KVA, which can be set up in parallel to reach up to 4 MW of clean energy.
The backup time can be extended via the use of flywheels set up in parallel or by traditional battery sets (Battery Hardening). This architecture is useful for using flywheels as the first source of backup power, thus protecting batteries from unnecessary discharges.
Flywheels also provide all the advantages of an auto transfer switch, as well as the advantages of practically instantaneous recharge compared with the hours or days required to recharge conventional batteries.

Power Solution in Container

Easy to move and transport, connect and power, the Riello PowerBox is a highly efficient solution ideal for:

- Modular data centres requiring modular uninterruptible power supplies
- Data centres in urban areas requiring additional power
- Public events requiring extra power for short periods
- Remote and military installations.



PowerBox is available in different combinations. Below are two examples of installations in 20 and 40-foot containers, with Riello UPS, a flywheel and a diesel generator.

MODELS	PowerBox 60,200,300	PowerBox 121.500.600
Features	**UPS + Flywheel + Generator**	**UPS + Flywheel + Generator**
UPS power	1 x 200 kVA	1 x 500 kVA
Flywheel	1 x 300 kW	1 x 600 kW
Diesel generator*	275 kVA	700 kVA
Input	400 A	1,000 A
UPS input	317 A	794 A
Batteries^	Optional Battery Boxes	Optional Battery Boxes
UPS output	289 A	724 A
Dimensions	[WxDxH] 605 x 243 x 253	[WxDxH] 1210 x 243 x 253
Container	20 feet	40 feet
Weight	8,000 kg	15,000 kg

Note: * 8 hour fuel tank, optional 20 hour tank, ^ from 5-10 minutes or more to provide extra resilience

Power solutions

Central Supply Systems CSS

1:1 **3:1** 6-15 kVA
3:3 10-100 kVA

EN50171 COMPLIANT

HIGHLIGHTS

COMPLIANT WITH STANDARD EN 50171
Ideal for emergency lighting and alarm systems.

DUAL INPUT
Simplicity and safety for the periodical system operation check.

PROTECTION AGAINST BATTERY INVERSION
Protection for emergency services and safety for operators.

HIGH RECHARGE CURRENT
Reduced recharge times.

CONTINUOUS OVERLOAD OF 120%
Large power reserve.

CASING COMPLIANT WITH STANDARD EN 60598-1
High mechanical protection.

BATTERIES WITH 10 YEAR LIFE
Long battery life.

The CSS (Central Supply System) range by Riello UPS is designed in compliance with standard EN 50171 and is therefore the ideal solution for installation in buildings subject to fire safety regulations and in particular for the power supply of emergency lighting systems. In addition the CSS range by Riello UPS is also suitable for supplying power to other emergency systems such as automatic fire extinguishing systems, alarm systems and emergency detection systems, smoke extraction equipment and carbon monoxide detection devices as well as dedicated security systems in sensitive areas.
The use of centralised supply systems (CSS) ensures a significant reduction in system set-up and maintenance costs as well as making periodical checks simpler and faster to perform.

DUAL INPUT

The Riello UPS CSS range is equipped with DUAL INPUT as standard on all models.
This important feature allows the mandatory scheduled checks on system operation and autonomy to be carried out with extreme ease and in complete safety by simply operating an input switch. This switch interrupts the power supply to the machine without interrupting the bypass line, which is able to support the load in the event of test failure.

HIGH RECHARGE CURRENT AND BATTERY CARE SYSTEM

Proper battery care is critical to ensuring correct CSS operation in emergency conditions.
The Riello UPS battery care system consists of a series of features and capabilities designed to obtain the best performance, extend operating life and satisfy the recharge times imposed by the standard.
The Riello UPS CSS range is designed in compliance with standard EN 50171 and ensures high current levels are available for the batteries, allowing recharge of up to 80% of full autonomy within 12 hours.
Riello UPS CSS are suitable for use with hermetically sealed lead-acid (VRLA), AGM and GEL batteries and Open Vent and Nickel Cadmium batteries. Different charging

methods are available depending on the battery type.
The recharge voltage compensation function based on temperature prevents excessive battery charges and overheating.
The deep discharge protection prevents reduced battery performance and battery damage.

HIGH OVERLOAD CAPACITY

As required by standard EN 50171, the Riello UPS CSS range is designed and sized to support continuous overloads (with no time limits) of up to 120% of the machine's nominal power rating.

PROTECTION AGAINST BATTERY INVERSION

Mandatory in line with standard EN 50171, protection against battery inversion ensures the safety of those carrying out maintenance operations on the devices and at the same time prevents damage to the system in the event that the batteries are inadvertently connected with the wrong polarity.

GENERAL FEATURES

In addition to the features mentioned here, the Riello UPS CSS range has all the features of reliability and flexibility common to the UPS range it derives from, as well as offering compatibility with the main options and accessories.

MODELS

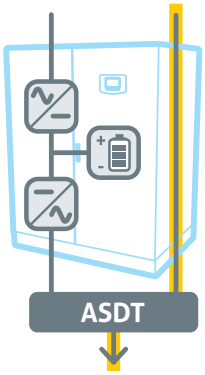
The Riello UPS CSS range is based on both single-phase and three-phase models divided into two product families, 1h and 3h, optimised to offer maximum runtimes of 1 hour and 3 hours respectively at nominal load in accordance with the parameters set out in standard EN 50171.
In particular the models in the 3h range feature transformer-based technology and provide maximum protection for the connected load.
The models in the 3h range are based on transformer-less technology, therefore providing improved efficiency and reduced footprints.

OPERATING MODE

Every Riello CSS model supports all the operating modes set out and described in standard EN50171, as below:

A Changeover mode

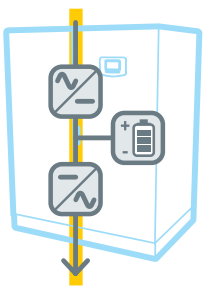
The load is supplied via the CSS bypass line (always supplied output "AS").



In the event of power supply failure the internal automatic device (ATSD) transfers the load to the inverter. The battery provides power to the inverter, ensuring the required runtime.

B Mode without interruption

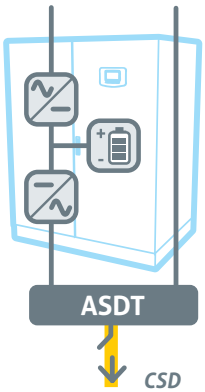
The load is supplied constantly by the CSS inverter (always supplied output "AS").



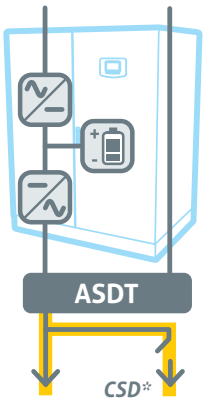
In the event of power supply failure the battery provides power to the inverter, ensuring the required runtime with no interruptions at all.

C Changeover mode with additional control switching device for control switching of the load

In addition to that described in points A and B, the equipment includes one or more switching devices (CSD), which rely on the availability of the normal power supply. On power supply failure the CSD device connects the load that up until that moment was not supplied (emergency only output "EO").



D Changeover mode with additional control switching device for partial switching of the load



Differently to that described in point C, part of the load is supplied without interruption whilst the remaining part is only supplied upon power supply failure thanks to the CSD device (always supplied + emergency only output "AS+EO").

**Requires EOS optional accessory*

EOS optional accessory

The EOS (Emergency Only Switch) accessory is required whenever one part of the load must always be supplied (always supplied output "AS"), and one part must be supplied only when mains power fails (emergency only output "EO"), in order to create the operating mode described in point D. By connecting several EOS accessories in a cascade configuration it is also possible to provide for the sequential delayed switching on of loads in order to reduce inrush switching on currents.

CSS 1h models	6 1 ph	10 1 ph	15 1 ph	10 3 ph	15 3 ph	20 3 ph	30 3 ph	40 3 ph	60 3 ph	80 3 ph	100 3 ph
INPUT											
Nominal voltage	220 - 230 - 240 Vac 1 ph 380 - 400 - 415 Vac 3 ph + N			380 - 400 - 415 Vac 3 ph + N							
Nominal frequency	50/60 Hz										
Frequency tolerance	40 - 72 Hz										
BYPASS											
Nominal voltage	220 - 230 - 240 Vac 1 ph			380 - 400 - 415 Vac 3 ph + N							
Number of phases	1			3 + N							
Voltage tolerance	180 - 264 V (selectable)										
Nominal frequency	50 or 60 Hz (selectable)										
Frequency tolerance	±5 (selectable)										
OUTPUT											
Nominal power (kVA)	6	10	15	10	15	20	30	40	60	80	100
Active power (kW)	5,4	9	13,5	9	13,5	18	27	36	54	72	90
Power factor	0.9										
Number of phases	1			3 + N							
Nominal voltage	220 - 230 - 240 Vac 1 ph			380 - 400 - 415 Vac 3 ph + N							
Static variation	± 1%										
Dynamic variation	± 3%										
Crest factor	3 : 1 Ipeak/Irms										
Voltage distortion	≤ 1% with linear load / ≤ 3% with non-linear load										
Frequency	50/60 Hz										
Frequency stability during battery operation	0.05%										
Overload	120% continuous @ Pf 0.9										
BATTERIES											
Type	VRLA AGM/GEL 10 years (external)										
Recharge time	80% of full autonomy in 12 hours										
Typical recharge current	0.2 x C_{10}										
Temperature compensation	-0.5 V/°C										
INFO FOR INSTALLATION											
Weight without batteries (kg)	105	110	120	110	120	135	145	190	200	220	380
Dimensions (WxDxH) (mm)	440 x 850 x 1320							500 x 850 x 1600			750 x 855 x 1900
Communications	3 slots for communications interface / USB / RS232										
Operating temperature	0°C / +40°C										
Relative humidity	90% non-condensing										
Colour	Dark grey RAL 7016										
Noise level at 1 m	< 52 dBA					< 48 dBA		< 56 dBA		< 58 dBA	< 70 dBA
IP rating	IP20										
Smart Active efficiency	up to 99%										
Standards	EN 50171 - European Directives: L V 2006/95/CE low voltage Directive EMC 2004/108/CE electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification in accordance with IEC 62040-3 (Voltage Frequency Independent) VFI - SS - 111										
Moving the CSS	castors (6 - 80 kVA) / transpallet (100 kVA)										

CSS 3h models	6 1 ph	10 1 ph	15 1 ph	10 3 ph	15 3 ph	20 3 ph	30 3 ph	40 3 ph	60 3 ph	80 3 ph	100 3 ph
INPUT											
Nominal voltage	380 - 400 - 415 Vac three-phase										
Nominal frequency	50/60 Hz										
Frequency tolerance	40 - 72 Hz										
BYPASS											
Nominal voltage	220 - 230 - 240 Vac 1 ph			380 - 400 - 415 Vac 3 ph + N							
Number of phases	1			3							
Voltage tolerance	± 5% ÷ ± 25%										
Nominal frequency	50 or 60 Hz (selectable)										
Frequency tolerance	± 1% ÷ ± 6%										
OUTPUT											
Nominal power (kVA)	6	10	15	10	15	20	30	40	60	80	100
Active power (kW)	5,4	9	13,5	9	13,5	18	27	36	54	72	90
Power factor	0.9										
Number of phases	1			3 + N							
Nominal voltage	220 - 230 - 240 Vac 1 ph			380 - 400 - 415 Vac 3 ph + N							
Static variation	± 1%										
Dynamic variation	± 3%										
Crest factor	3 : 1 Ipeak/Irms										
Voltage distortion	≤ 1% with linear load / ≤ 3% with non-linear load										
Frequency	50/60 Hz										
Frequency stability during battery operation	0.05%										
Overload	120% continuous @ Pf 0.9										
BATTERIES											
Type	VRLA AGM/GEL; NiCd; Li-ion 10 years (external)										
Recharge time	80% of full autonomy in 12 hours										
Typical recharge current	0.2 x C_{10}										
Temperature compensation	-0.5 V/°C										
INFO FOR INSTALLATION											
Weight without batteries (kg)	200	220	230	241	256	315	335	460	540	600	610
Dimensions (WxDxH) (mm)	555 x 740 x 1400							800 x 740 x 1400		800 x 800 x 1900	
Communications	2 slots for communications interface / 2 RS232 / dry contacts										
Operating temperature	0°C / +40°C										
Relative humidity	90% non-condensing										
Colour	Dark grey RAL 7016										
Noise level at 1 m	60 dBA						62 dBA			65 dBA	68 dBA
IP rating	IP20										
Smart Active efficiency	up to 98%										
Standards	EN 50171 - European Directives: L V 2006/95/CE low voltage Directive EMC 2004/108/CE electromagnetic compatibility Directive Standards: Safety IEC EN 62040-1; EMC IEC EN 62040-2 C2 Classification in accordance with IEC 62040-3 (Voltage Frequency Independent) VFI - SS - 111										
Moving the CSS	transpallet										

Software and accessories

PowerShield³

SHUTDOWN SOFTWARE

PowerShield³ is available for download at www.riello-ups.com

HIGHLIGHTS

GRAPHIC MONITORING OF UPS AND ENVIRONMENTAL SENSOR STATUS
PowerShield³ is a simple but powerful UPS management tool. A graphic version is available for all operating systems.

DETAILED DISPLAY OF ALL UPS AND ENVIRONMENTAL SENSOR PARAMETERS
PowerShield³ provides all the information required for first level diagnostics.

EVENTS LOG AND GRAPHIC DISPLAY OF MAIN PARAMETERS
All changes in UPS operating states are logged, as well as the main physical values and parameters. These constantly recorded values are displayed in graphic format.

UPS CONTROL PROGRAMMING
This allows you to automate all the actions normally carried out by the user: turning the server on and off, UPS battery test, etc.

GRAPHIC MONITORING OF UPS STATUS VERSION FOR MAC OS X
PowerShield³ software is the only control and shut-down software able to run on a Macintosh system with a client-server cross-platform architecture. It allows integration in TCP/IP networks with Windows, Novell, and the most widely used UNIX operating systems. It supports the NetMan series of network agents for UPS management via network. Multi-lingual support.

BLOCK DIAGRAM OF OPERATION
A display of UPS operation in the form of a block diagram makes the analysis of UPS operating states more intuitive.

NOTIFICATION OF ALARMS VIA E-MAIL, SMS, FAX AND VOICE MESSAGE
PowerShield³ can be configured to automatically forward alarm warning messages via e-mail, SMS, fax and voice message.

PowerShield³ provides efficient, user-friendly UPS management, displaying all major operational information such as input voltage, applied load and battery charge. The software also provides detailed information on fault conditions and UPS operating states. Developed with a client/server architecture, it is the ideal tool for managing multi-platform network systems.

Features

- **PowerShield³ free version: supports a single UPS for the operating systems highlighted in green.**
- **PowerShield³ full version: supports up to maximum of 32 UPS for all operating systems.**
- With sequential and priority-based shutdown, PowerShield³ provides unattended shut-down of all networked PCs, saving any active work on the most widely used applications. Users can define the shutdown priorities for the various computers in the network and can also customise the procedure.
- With multi-platform compatibility, PowerShield³ uses the TCP/IP communications protocol to achieve standardised management and monitoring across the widest possible range of platforms. This makes it possible to monitor computers with different operating systems from a single console, for example monitoring a UNIX server from a PC running Windows and also connecting to UPS located in different geographical areas using dedicated networks (intranets) or the Internet.
- With event scheduling, PowerShield³ users can program their own shutdown procedures, detailing power-off and power-up scenarios to increase system security and save energy.
- With messages management, PowerShield³ keeps users constantly informed about the status of UPS and environmental sensors, either locally or via network messages. A list can also be defined of users who should receive e-mails, faxes, voice messages and SMS messages when faults or sudden mains power supply failures occur.
- Integrated SNMP agent: PowerShield³ features an integrated SNMP agent for UPS management which can send all the information required and generate traps using the RFC1628 standard, and environmental sensors.
- Secure, easy to use and connect; communication is now password protected to ensure UPS system security. Using the new discovery/ browsing function, all UPS connected to a protected computer and/or LAN can be displayed in a list format for monitoring. In the absence of a LAN connection, support is provided for modem-based communication.

Supported operating systems

- Windows 2000, 2003 Server, XP, Vista, 2008 Server, 7, 8, on X86, X86_64 and IA64 processors
- Linux on X86, X86_64 and IA64 processors
- Novell Netware 3.x, 4.x, 5.x, 6
- Mac OS X
- VMWare ESX, VSPHERE.
- The most common UNIX operating systems such as:
  IBM AIX, HP, SUN Solaris INTEL and SPARC, SCO Unixware and Open Server, Silicon Graphics IRIX, Compaq Tru64 UNIX and DEC UNIX, Open BSD UNIX and FreeBSD UNIX, NCR UNIX
- HP OPEN VMS.

PowerNetGuard

INVENTORY MANAGER SOFTWARE

PowerNetGuard is available for download at www.riello-ups.com

HIGHLIGHTS

GRAPHIC MONITORING OF UPS AND ENVIRONMENTAL SENSOR STATUS
PowerNetGuard is a simple but powerful UPS management and display tool. A graphic version is available for all operating systems.

DETAILED DISPLAY OF ALL UPS AND ENVIRONMENTAL SENSOR PARAMETERS
PowerNetGuard provides all the information required for first level diagnostics.

EVENTS LOG AND GRAPHIC DISPLAY OF MAIN PARAMETERS
All changes in UPS operating states are logged, as well as the main physical values and parameters. These constantly recorded values are displayed in graphic format.

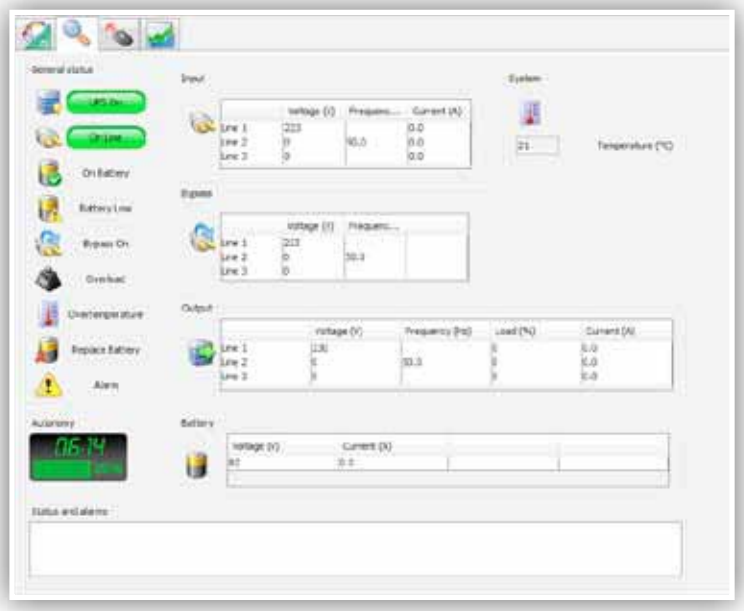
CENTRALISED MANAGEMENT
PowerNetGuard is the ideal solution for managing all UPS in an infrastructure using a single application. With this one application you can monitor and manage all your UPS, ensuring prompt warnings in the event of faults or malfunctions.

SUPPORT FOR THIRD PARTY UPS
PowerNetGuard also allows you to manage UPS made by other manufacturers via SNMP using their own network boards. This allows you to centralise the management of the UPS fleet into a single system without the need for many different applications, simplifying management and use.

PowerNetGuard software centralises UPS management using network interface (SNMP) communications. It is ideal for Data Centre EDP managers and medium to large-sized networks. Using the RFC1628 Management Information Base (MIB), it ensures standardised management for all UPS compliant with this worldwide standard.

Features

- Centralised control of remote UPS via Ethernet with SNMP protocol
- Multi-level display of geographical areas, building plans, maps, etc.
- Multi-user access with various security levels
- Compatible with NetMan and RFC1628 standard SNMP agents
- Creation of graphs of input and output values and data back-up to file
- Alarm notifications via e-mail and SMS
- Integrated Wap Server for alarm display
- For Windows operating systems (2008 Server, Vista, 2003 and XP), Linux, Solaris 8, 9 and 10, and Silicon Graphics IRIX



NetMan 101/102 Plus

BOX - ETHERNET - SNMP

The NetMan plus network agent allows UPS management across a LAN 10/100 Mb direct connection using any of the main network communication protocols (TCP/IP, HTTP and SNMP).
It was developed to integrate UPS into medium-sized and large networks, to provide a high level of reliability in communication between the UPS and associated management systems.

Features

- Compatible with 10/100 Mbps Ethernet
- Compatible with PowerShield[3] and TeleNetGuard
- SNMP with RFC1628 for PowerNetGuard and NMS connection
- SNMP with RFC3433 for managing environmental sensors
- HTTP for UPS control via web browser
- SMTP for alarm notifications and UPS status updates via email
- Serial port for UPS control
- Modem management for TeleNetGuard and PowerShield[3]
- Events log management
- Wake-on-LAN management for starting computers via TCP/IP network
- Other standards: DHCP, DNS, RARP, FTP, NTP, ICMP, IGMP
- Configurable via Telnet multi-sessions or serial terminal with data import/export
- Firmware upgradeable via serial port and TFTP server.

NetMan 202 Plus

CARD - ETHERNET - SNMP

The NetMan 202 plus network agent allows UPS directly connected over LAN 10/100 Mb connections to be managed using the main network communication protocols (TCP/IP, HTTP and SNMP). It is the ideal solution for the integration of UPS over Ethernet networks with MODBUS/TCP protocols. It was developed to integrate UPS into medium-sized and large networks, to provide a high level of reliability in communication between the UPS and associated management systems.

Features

- 32bit RISC processor
- Compatible with 10/100 Mbps Ethernet and IPv4/6 networks
- Compatible with PowerShield[3] and TeleNetGuard
- SNMP v1 and v3 with RFC1628 for PowerNetGuard and NMS connection
- SNMP v1 and v3 with RFC3433 for the management of environmental sensors
- HTTP for UPS control via web browser
- SMTP for alarm notifications and UPS status updates via email
- MODBUS/TCP
- Maximum expandability
- USB host for Pendrive USB connection
- Events log and data management
- Wake-on-LAN management for starting computers via TCP/IP network
- Other standards: DHCP, DNS, RARP, FTP, NTP, ICMP, IGMP
- Management of environmental sensors
- Configurable via Telnet or SSH sessions, and serial terminal with data export/import
- Firmware upgradeable via USB port, FTP and http.

Environmental sensors

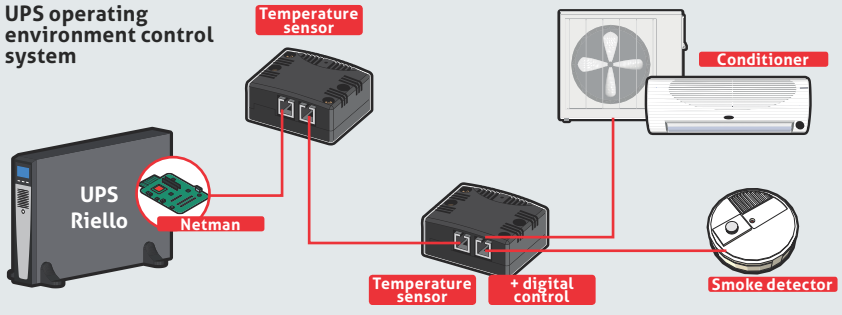
FOR NETMAN 101, 102 AND 202 PLUS

The NetMan plus environmental sensors are able monitor and record environmental conditions as well as activities in protected areas and the area where the UPS is installed. The environmental sensors allow management and control to be extended to cover the area around the UPS, monitoring the temperature and humidity and driving cooling fans or locks. Values are provided via Internet, SNMP and via PowerShield[3] software.
PowerShield[3] can be used to manage sensor operating states in order to send messages. Refer to PowerShield[3] software documentation for further information.
NetMan plus can manage up to 6 separate sensors. Environmental sensors are quick to install thanks to their small footprint, and they do not require a separate external power supply. Thanks to the self-learning sensors, configuration is also rapid and intuitive.

The following sensors are available:

- **-55 +125 °C Temperature Sensor**
- **-55 +125 °C Temperature and 0-100% humidity Sensor**
- **-55 +125 °C Temperature and I/O digital 0-12 Vdc In, 1A max Out at 48 Vdc Sensor.**

UPS operating environment control system



MultiCOM 301/302

BOX/CARD - MODBUS/JBUS INTERFACE

The MultiCOM 301/302 protocol converter allows UPS monitoring using the MODBUS/JBUS protocol over RS232 or RS485 serial lines.
In addition, it also manages a second independent RS232 serial line that can be used to connect to other devices such as the Netman 101 or a PC running PowerShield³ software.

Features

- Port configuration for MODBUS/JBUS as RS232 or RS485
- Management of two independent serial lines
- Suitable for integration with the main BMS management programs.

MultiCOM 351/352

BOX/CARD - INTERFACE DUPLEXER

The MultiCOM 351/352 serial duplicator is an accessory that allows two devices to be connected to a single communication serial port on the UPS.
It can be used anywhere where several serial connections are required for multiple polling of the UPS. It is ideal for LAN networks with firewalls, where a high level of security is required, or for the management of separate LAN networks supplied by a single UPS.

Features

- Cascading configuration giving a maximum of 4 serial communication ports
- LED communication flow indicator
- Firmware upgradeable via serial port.

MultiCOM 372

CARD - RS232 INTERFACE

The MultiCOM 372 allows an additional communication port to be added to the UPS to control and monitor the UPS via the RS232 serial line.
The board is supplied with an ESD (UPS Emergency Shutdown) input and an RSD (Remote Shutdown) input, both available on a removable terminal board and directly connectible to emergency buttons or other buttons.

Features

- Management of ESD input and UPS Shut-down
- Ability to supply devices at 12 V 80 mA max.

For compatibility, refer to the Table on page 16

MultiCOM 382

CARD - RELAY I/O INTERFACE

The MultiCOM 382 provides a set of relay contacts for managing UPS alarm notifications and operating states. The board has two removable terminal boards. One of these terminal boards includes the ESD (UPS Emergency Shut Down) and RSD (Remote Shut Down) signals.
The board also provides the possibility of associating Battery Working, Bypass, Alarm and Battery Low warnings with potential free changeover or normally open contacts.

Features

- Max. current 3A at 250Vac
- Signal-contact customisation.

For compatibility, refer to the Table on page 16

MultiCOM 401

BOX - PROFIBUS DP INTERFACE

The MultiCOM 401 is an accessory that allows UPS to be connected to a Profibus DP network. The device integrates UPS management and monitoring in a control system based on a field bus that is among the most widely used in the industrial sector for communication between control / automation systems and distributed I/O.

Features

- Profibus DP-V1 protocol
- Configurable addresses from 0 to 99
- Data format: Profidrive V2 PP05
- Communication speed configurable from 9.6 kBit/s to 12 MBit/s
- LED displaying the communication flow.

Multi I/O

BOX - RELAY I/O CARD & MODBUS/JBUS INTERFACE

The Multi I/O is a device that integrates UPS into a control system using fully configurable input and output relay signals.
It can be used to connect two devices to a single UPS serial communication port.
It can be used anywhere where several serial connections are required for multiple polling of the UPS.
It can also communicate on RS485 lines using the MODBUS/JBUS protocol.

Features

- 8 analogue/digital inputs
- 8 relay outputs (3A at 250Vac) that can be configured using UPS and input operating states
- Can communicate with UPS via RS232
- It can control two independent RS232/ RS485 serial lines to monitor the UPS and its operating states using the MODBUS/ JBUS protocol
- Firmware upgradeable via serial port.

I/O

EXPANSION BOARD

The I/O expansion board for the Master range is equipped with:
- 6 outputs with NC/NO potential-free contacts (250 V/5 A), electrically isolated from each other and from other circuits
- 2 self-powered inputs.

Each output or input can be configured with different meanings, using the associated menu.

For compatibility, refer to the Table on page 16

Kit for AS400 and i-Series

COMMUNICATIONS KIT

The IBM AS/400 system has a single-level memory management feature that makes it almost compulsory for the system to be connected to a UPS. This is because a momentary loss of power with consequent anomalous shutdown can lead to lengthy or even extremely lengthy reboot periods.

Also, even simple interference in the power supply can lead to hardware damage.
The AS/400 interface kit allows the OS/400 operating system to initiate an orderly system shutdown on mains failure.

Features
- Compatible with all AS/400 and i-Series systems
- Supports all UPS in the Riello UPS range.

Modem GSM

MODEM

The GSM modem is able to send SMS messages detailing operating states and alarm warnings for devices monitored by PowerShield³ control software and PowerNetGuard supervision software.

RTG 100

GPRS MODEM

The GPRS RTG 100 terminal is able to manage UPS connected directly to the GSM mobile telephone network.
It was developed to integrate UPS into the TeleNetGuard remote control system for complete control of UPS and diagnostics in the event of failure
without the need for landline connections.
The RTG 100 is able to communicate constantly with UPS to provide the TeleNetguard remote control system or PowerShield³ software with a valid alternative to connection systems employing communication cables.

Features

- Ability to send SMS messages detailing UPS operating states and alarms
- Compatible with PowerShield³ and TeleNetGuard
- Events log management
- Firmware upgradeable via GSM.

Multi Panel

REMOTE DISPLAY INTERFACE

The Multi Panel is a remote monitoring device that can provide a detailed UPS status overview in real time. This device is able to display mains power, output and battery readings as well as UPS operating states. The high visibility graphic display supports English, Italian, German, French, Spanish, Russian, Chinese and many other languages.
It has 3 independent serial ports, one of which allows for UPS monitoring via the MODBUS/JBUS protocol (on either an RS485 or RS232 serial line). The other independent serial lines can be used to connect devices such as the Netman 101 Plus or a PC running PowerShield³ software.

Features

- High visibility LCD with graphic functions
- Management of three independent serial lines
- Port configuration for MODBUS/JBUS as RS232 or RS485
- Suitable for integration with the main BMS management programs
- Firmware upgradeable via serial port.

Multi Pass 10, 16, and 16-R

MAINTENANCE BYPASS

The Multi Pass manual bypass cuts out UPS in the event of malfunction or breakage. Multi Pass ensures that the connected consumers are automatically switched to mains power if a UPS is switched off or goes into blocked status. Multi Pass is available for rack or wall installations (box).

Features

- 16 A rack version
- 10 A and 16 A wall version
- Standard back-feed protection
- Automatic switching during mains failure
- Mains power present LED indicator
- Available with different socket standards (IEC, British socket, terminal boards).

MBB32A

MAINTENANCE BYPASS

Available in a 32 A single-phase configuration, enables UPS servicing up to 6kVA in a quick and safe manner ensuring power continuity. Equipped with a metal bracket for wall mounting.

MBB100A

MAINTENANCE BYPASS

Available in a single configuration that allows for manual bypass operations on any single-phase UPS from 10-20 kVA and three-phase UPS from 10-40 kVA. The device is equipped with three disconnect switches as shown in the attached diagram to allow for the complete isolation of the UPS in the event of maintenance or removal, whilst guaranteeing power supply continuity to the consumers. The device is equipped with a manual bypass closure warning micro-switch to be connected to the dedicated input on the UPS in order to prevent simultaneous supply from the manual bypass and inverter.

RIELLO UPS offers a wide range of external bypasses and static switches for UPS up to 800 kVA, and for parallel systems up to 6.4 MVA.

Connectivity

Index of configurations

Connecting a UPS to other devices, sensors, computers and other specific devices, means on the one hand allowing the user to monitor UPS operating parameters and prevent critical situations, and on the other hand provides the UPS with input parameters from the working environment. By processing these parameters the UPS is able to activate/deactivate itself, communicate its status and much more.

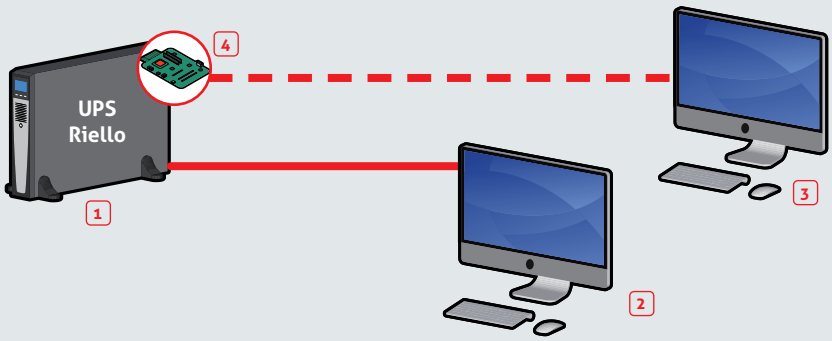
This brief overview summarises some of the basic connectivity configurations, grouped according to the end purpose and situation surrounding each case.

- **Point to point connections**
- **Multipoint connection**
- **Connection for UPS in parallel setup**
- **Connection with several systems in parallel setup and STS**
- **Field bus connections**
- **Bus connections over Ethernet**
- **Field bus connections**
- **Serial bus connections**

POINT TO POINT CONNECTIONS

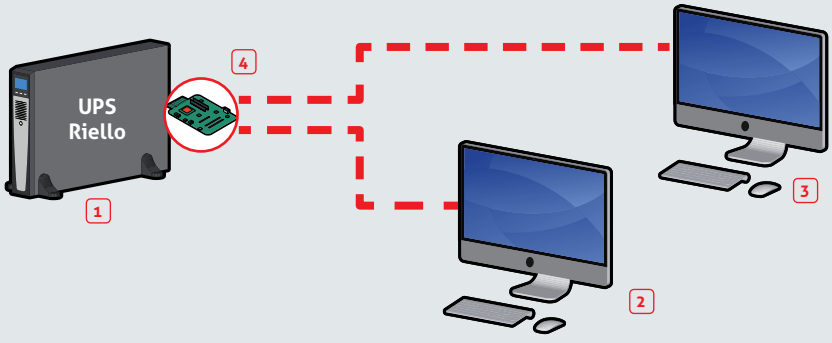
Controlling the UPS from 1 workstation

1	UPS connected to load
2	Local computer with PowerShield³ version FREE
▬	USB or RS232



Controlling the UPS from different workstations

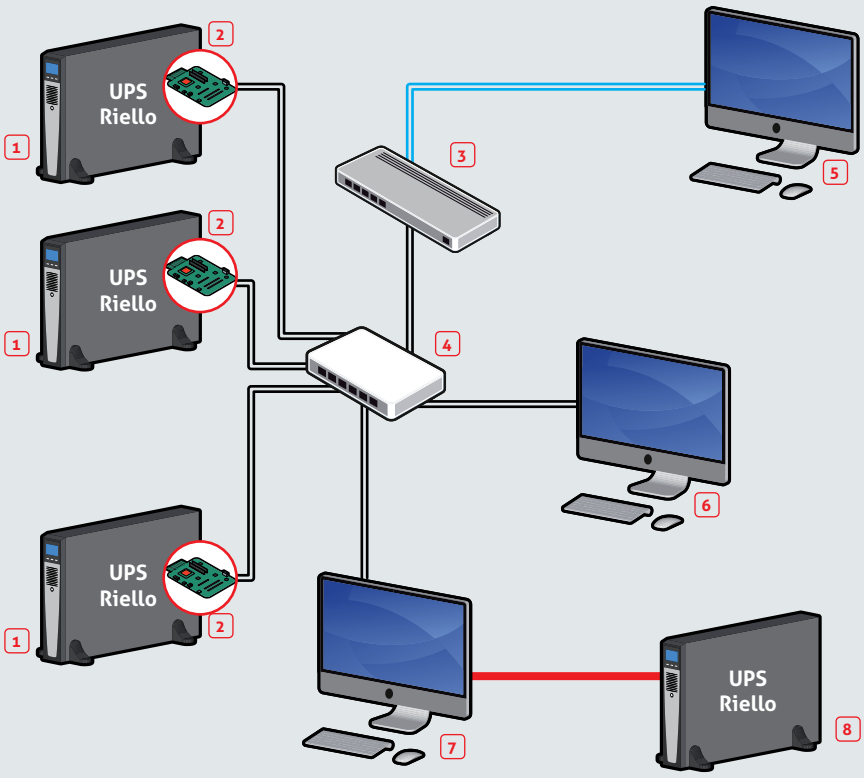
1	UPS connected to load
2	Local computer with PowerShield³ version FREE
3	Local computer with PowerShield³ software version FULL
4	MultiCOM 372 board
- -	RS232
▬	USB or RS232



UPS control from several workstations, using 2 serial ports

1	UPS connected to load
2	Local computer with PowerShield³ version FREE
3	Local computer with PowerShield³ version FREE
4	MultiCOM 352 board
- -	RS232

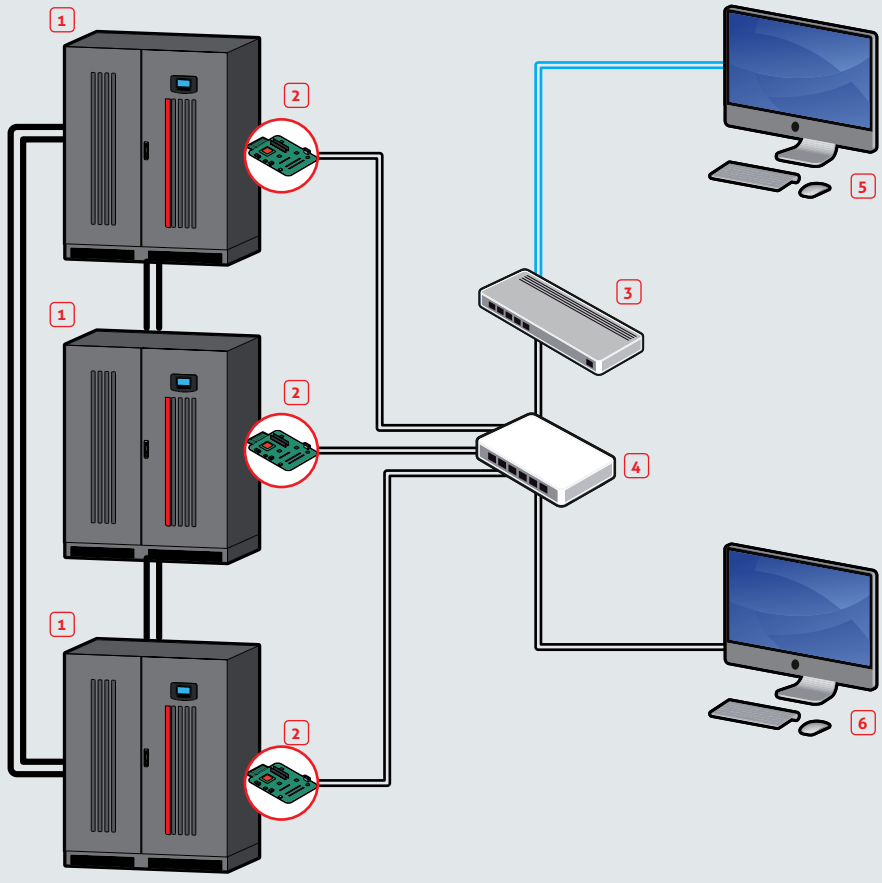
DISTRIBUTED CONNECTION (MULTIPOINT)



Connection with more than 1 UPS.
The FULL version of PowerShield³ software is required as well as a NetMan 101/102 communication board on each UPS.

1	UPS connected to load
2	NetMan 102 board
3	Firewall
4	Switch
5	Remote computer connected via web
6	Local computer
7	Local computer that controls the UPS (8) via USB or RS232, and UPS (1) via LAN and Ethernet
8	UPS connected to load
	USB or RS232
	Ethernet
	World Wide Web

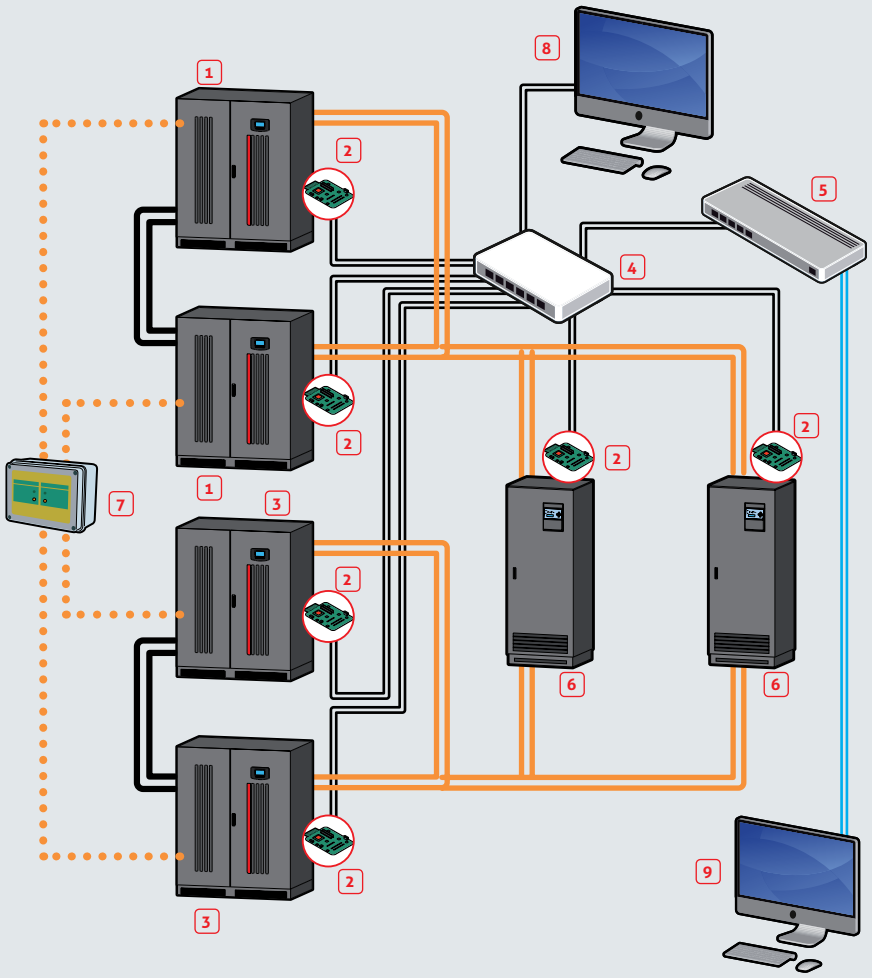
CONNECTION FOR UPS IN PARALLEL SETUP



The FULL version of PowerShield³ software should be used for managing setups with several UPS installed in parallel, and each UPS must have a NetMan 102 plus (or box 101 plus) board installed.

1	UPS in parallel setup connected to the load
2	NetMan 102 board
3	Firewall
4	Switch
5	Remote computer connected via web
6	Local computer
	Ethernet
	World Wide Web
	Parallel setup bus

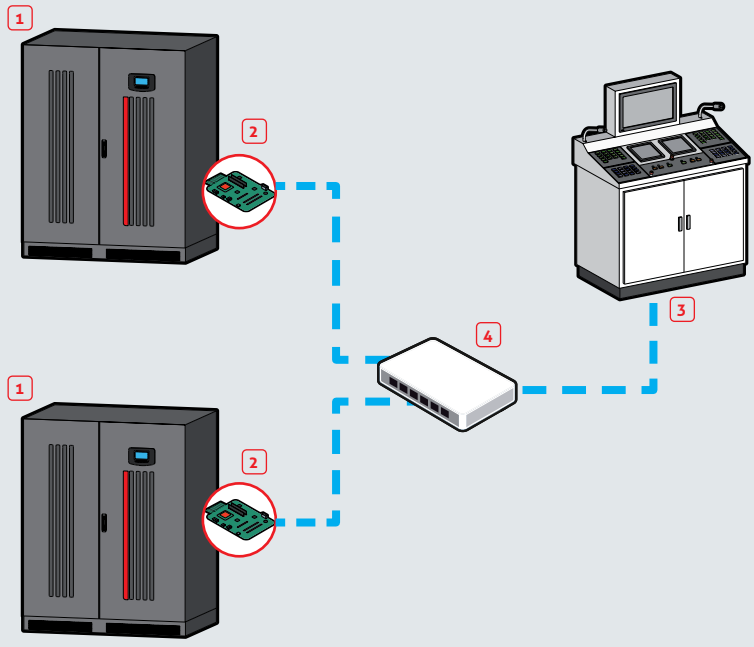
CONNECTION WITH SEVERAL SYSTEMS IN PARALLEL AND STS



The FULL version of PowerShield³ software should be used for managing setups with several UPS installed in parallel, and each UPS must have a NetMan 102 plus (or box 101 plus) board installed.

1	UPS arranged in parallel connected to an STS channel
2	NetMan 102 board
3	UPS arranged in parallel connected to an STS channel
4	Switch
5	Firewall
6	STS connected to load
7	UGS
8	Local computer with PowerShield³ software version FULL
9	Remote computer connected via web, running PowerShield³ software version FULL
	UGS management of parallel setup
	Parallel setup bus
	Ethernet
	World Wide Web
	Parallel setup bus
	Power connection

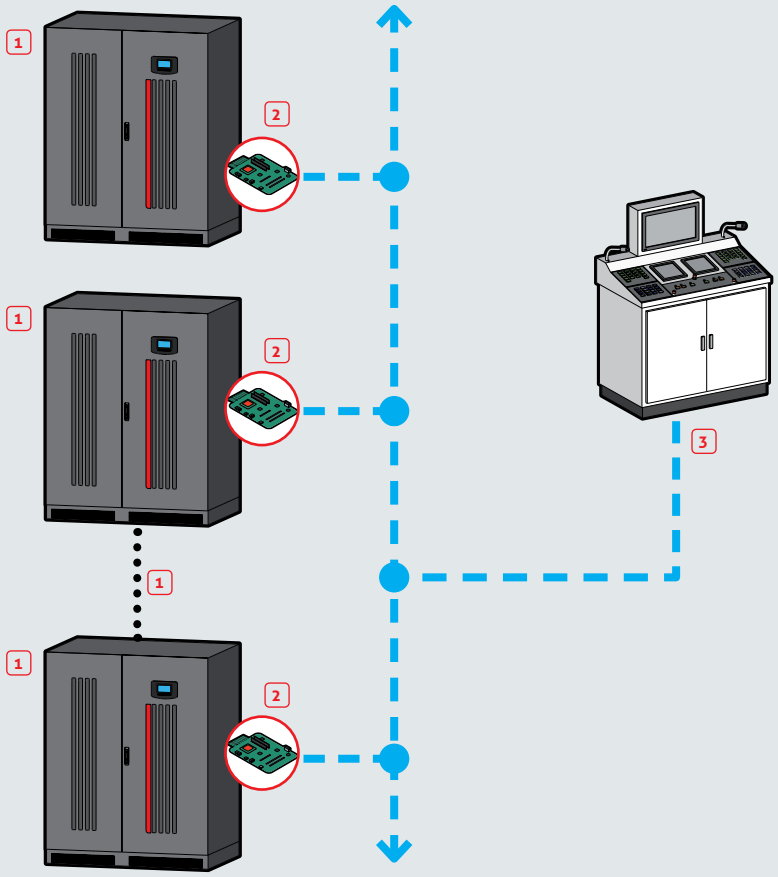
FIELD BUS CONNECTION OVER ETHERNET



For UPS management in industrial or civil environments requiring Modbus protocol communication over Ethernet.

1	UPS connected to load
2	NetMan 202 board
3	SCADA management system
4	Switch
	Ethernet
	Modbus / TCP over Ethernet

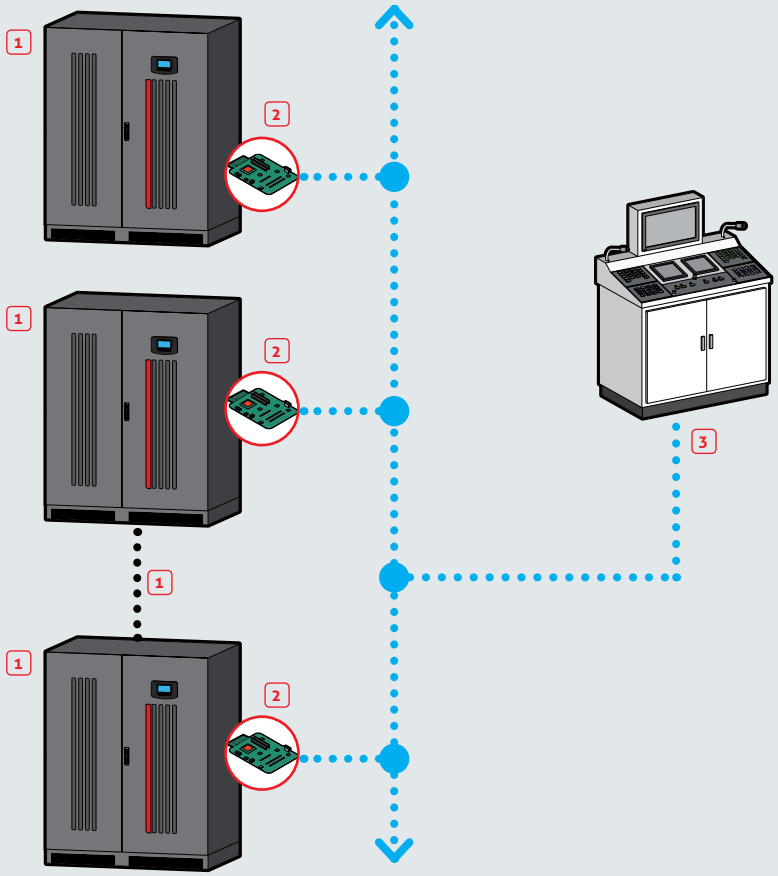
MODBUS SERIAL FIELD BUS CONNECTION



For UPS management in industrial or civil environments requiring Modbus protocol communication over RS 485 line.

1	UPS connected to load
2	NetMan 302 board
3	SCADA management system
═	Ethernet
- -	Modbus RS485

PROFIBUS DP SERIAL FIELD BUS CONNECTION



For UPS management in industrial or civil environments requiring communication via Profibus DP protocol.

1	UPS connected to load
2	NetMan 401 board
3	SCADA management system
═	Ethernet
• • • •	Profibus DP

Services

PRE-SALES CONSULTANCY

tec@riello-ups.com

RENTING

The TEC team
Our TEC (Technical Energy Consultant) experts have been working in the power sector for years, and come from backgrounds with technical experience in industry and power plants.

Consultancy on standards
Regulatory standard consultancy concerning:
- Products and portfolio solutions
- Batteries, flywheels, super capacitors
- Installation and configuration
- Applications (emergency lighting, electro-medical, data centres, railways etc.)

Work tools Training and information
- UPS sizing
- Official technical guides
- Installation requirements
- TEC newsletters
- Technical specifications
- Online tools (TEC area, UPS configurator, runtime calculation, etc.)

Technical seminars
Seminars can be requested by engineering firms or end customers directly and can also be proposed by TEC for sector associations and colleagues.

Design support
The TEC team can provide technical assistance concerning the choice, sizing and installation of our products and solutions.

Help Desk
The TEC service is available by phone, fax or e-mail to answer your requests immediately.

Witness test
The witness test service is provided for checking solutions before transport to the installation site.

Why rent?
- Renting a UPS system from Riello is an ideal way to protect your investment from the risks of technological obsolescence and the limitations of ownership
- Renting does not require any minimum duration obligations and the fees are considered as operating costs and are therefore tax deductible.
- By renting a UPS, the customer enjoys the benefits of using the latest technologies without the disadvantages of ownership.

Advantages
- Immediate UPS availability.
- Maintenance and assistance for the entire duration of the rental lease.
- Variable and flexible rental contracts: from 36 to 60 months.
- Increased reliability thanks to the presence of constantly updated UPS.
- Fully comprehensive insurance.

Guaranteed services
- Dedicated freephone number.
- Dedicated e-mail address.
- Guide for choosing a UPS.
- Priority intervention thanks to the extensive network of Riello Service Centres.
- Remote monitoring.
- Removal of old UPS.

TECHNICAL ASSISTANCE

service@riello-ups.com

TELENETGUARD REMOTE MONITORING 24/7

The Service team

Our technical assistance facility uses highly trained engineers to provide a reliable and competent technical support and efficient after-sales service.

The services

Service can provide customers with:

- a dedicated call-centre for direct contact with the Service organisation. Service personnel are always available and ready to provide advice and assistance regarding UPS installation and maintenance.
- The new free swap assistance service
- an on-site support service for larger UPS that cannot be transported, whether or not they are covered by the warranty. A fast repair on site is guaranteed through the use of state-of-the-art UPS technology, the professionalism of the Service personnel and Authorised Assistance Centres nationwide. Service guarantees that any spare parts used are original, tested and up-to-date.
- Service can provide assistance during the installation and initial start-up of the products and train on-site personnel. Technical Service engineers can also verify site suitability, analyse and advise on rental solutions and disconnect and relocate equipment

Service
1st start

- Maintenance contracts can be provided by Service to minimise the risks and costs connected with UPS breakdowns. Many types of maintenance contract are available, ranging from periodic inspections to comprehensive cover including labour and materials.
- Service regularly organises technical training courses for technicians at the Riello UPS training centre.

Remote monitoring

The remote monitoring service consists of a modem connection (GSM or dedicated telephone line) between your UPS and the Riello UPS Service Centre. In the event of failure your UPS will automatically call the Service Centre, which assesses the parameters sent and determines the priority of the call (distinguishing between a real failure and a simple alarm), and simultaneously transmits the alarm via fax, email or SMS to the customer.

Advantages

With TeleNETGuard, our Service Centres are able to intervene, already knowing the nature of the problem and thus shortening the time required to resolve the fault. The system also regularly transmits more than 500 UPS parameters to the Service Centre to help prevent any issues arising from the ageing of individual electronic components. With this service your UPS is monitored 24 hours a day, 7 days a week.

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